



AGRICULTURAL RESEARCH INSTITUTE

PUSA

THE
JOURNAL OF AGRICULTURE
AND
INDUSTRY
OF
SOUTH AUSTRALIA.

ISSUED UNDER THE DIRECTION OF THE HON. MINISTERS OF
AGRICULTURE AND INDUSTRY.

AGRICULTURAL EDITOR, A. MOLINEUX, F.L.S., F.R.H.S.,
GENERAL SECRETARY AGRICULTURAL BUREAU.

INDUSTRIAL EDITOR, J. BANNIGAN,
INSPECTOR OF FACTORIES.

VOL. IV.—August, 1900, to July, 1901.

ADELAIDE:
BY AUTHORITY: C. E. BRISTOW, GOVERNMENT PRINTER.

1901,

INDEX.

AGRICULTURE.

	Page.
Agricultural and Live Stock Statistics	119, 988
Agricultural Bureau, Attendance at Branch Meetings	254
“ “ Membership of Central	595
“ “ Payment to Secretaries of	174
“ “ Shows (Appila-Yarrowie)	748
“ “ “ (Cherry Gardens)	747
“ “ Suggestions for Improvement of	143, 296
“ “ Working of	903
“ College, Supplementary Farm in connection with.. .. .	661
“ “ Visit to	386
“ Education	815
“ “ in State Schools	892
“ Implements at Field Trials and Shows	457
“ Show Societies	109
“ Shows	184, 307, 328, 540
Agronomy	1008
Algaroba Bean	987
Alkaline Soils	72
Almonds	1035
Angora Goats	899
Ants on Peach and Mulberry Trees	65
“ Puzzlers	333
Aphis	70, 161, 181, 1021
Apple, Export of	13, 56, 72, 115, 160, 164, 482, 1033
“ “ to West Australia	1033
“ Growing	447
“ “ in South-East	380
“ Houses for	165, 539
“ Industry	543, 741
“ Storing	52
“ Uses of	712
“ Valuable Varieties for Export	576
Apples, Bitter Pit in	842
Attemperateurs or Coolers in Wine Fermentation	566
Australian Apples in London	13
Axle Grease	167
Bacon Curing.. .. .	171, 303, 397, 402, 823, 844, 914, 964
“ Feeding for	571
Baking Powder, Substitute for	813
Barrels, Cleaning of	899
Bees in the Orchard	653
“ Management of	611
“ Wintering	920
Beet Rust	76
Beetles, Poison for	108
Bird Pests	819
Bitter Pit in Apples	842
Black Currants, Cultivation	906
Black Rust in Wheat	315, 469, 833
“ Spot	938
Bones, Cattle Eating	769, 824
“ Reducing with Quicklime	535

	Page.
Bot Fly	394, 488, 523, 610
Broom Corn	424, 588, 844
Bullock Harnessing	694
Bulls, Fence Breaking	344, 391, 719
“ Licensing of	140
“ Purchase of for Branch Bureaus	5, 733
“ Taming	719
Bunt and Fertilisers	546, 674
“ Prevention of	49, 66, 489, 499, 538, 694, 827, 923
Bush Fires	836, 837
Butter (Choice), Manufacture of	865
“ Export of	114, 315
“ “ Low Grade	95, 171
“ Fishiness in	79, 638
“ Grading	802
“ “ and its Educational Value	263
“ Keeping Cool	109
“ Making, Losses in	266, 564
“ Testing, Government	634, 725
“ Fat, South Australian Percentages	563
“ Milk, Fat in	266
Cabbage Seed	474
Californian Fruit Industry	513
Calves, Dishorning	454
“ Skim Milk for	21
“ Raising	82
Camphor Industry	987
Candied Peel	108
Canning Fruit	508, 509
Castor Oil Growing	590
Cattle Complaints (<i>see</i> Stock Complaints)	
“ Dairy <i>v.</i> Beef	150
“ Dehorning	454, 540
“ Finding Age of	596
“ Local Diseases in	739
“ Summer Feeding of	1027
“ Worms in	22
Caterpillar Plagues	107, 146
Caterpillars and Wheat	294, 313, 377
“ Poisoned Baits for	108
Central Australia, an Hour's Chat on	387
Cereals, Cultivation and Manuring	311
Chaff, Mixed	249
“ Standard Weight of	34, 140, 152, 256, 405, 463, 594
Cheddar Cheese, Testing	632
Cheese, Holey and Gasey Curd in	634
Cheese-making, Boracic Acid in Milk	565
“ Faults in	97
“ Losses of Fat	564
Cherries, Packing for Export	528
Cider Making	918
“ Vinegar	1020
Cocky Chaff	847
Codlin Moth Regulations and Treatment	140, 142, 615, 678, 734, 762, 819, 829, 832, 834, 837, 843, 846, 896, 898, 909, 920, 931, 936, 998, 1001, 1035
Cold Storage of Fruit	867
Colt Breaking	1008
Conferences—	
Far Northern Branches (Quorn)	662
Hills Branches (Cherry Gardens)	364
Murray River Branches (Mannum)	730
Northern Branches (Gladstone)	654
South-Eastern (Penola)	888
Southern (Strathalbyn)	738
Congress of Bureaus in Adelaide	201
“ Railway Passes for Delegates to	249
Contagious Diseases in Great Britain	82

INDEX.

	v. Page.
Co-operation	63, 157, 296, 492, 541, 604, 841, 929
Co-operative Agricultural Experiment Union	11
Coorong Sand Hummocks	626
Copra Cake	77
Cow on the Block	370
Cows Chewing Bones	769, 821
" Winter Housing of	144
Crops, Constituents of	267
" Volunteer	308
Crows	913
Crystallised Fruit	509
Cucumbers, Pickling and Salting	358, 815
Cultivation	539
" Deep	541
" Summer	669
Curculio Beetle	536, 843, 928
Curl Leaf on Peach Trees	37, 493
Dairy Bulls, Purchase by Branches	5, 557
" Cattle and Dairying	49
" Cows and Calves	1033
" Herds, Disease and Death in	53
" Produce at Agricultural Shows	805
" Progress	735
" Produce, Contamination of	257
Dairying	49, 156, 234, 410, 612, 668, 743
" on Forty Acres	177
" Acid Milk	260
" Acidity Apparatus	264
" Colostrum Milk	262
" Cream Rooms	261
" Dirty Udders and Unclean Milking	259
" Germ Life, Conditions Favorable to	258
" Pasteurised Milk	260
" Suppliers' Problem	265
Damson, The Vermont	108
Danish Egg Trade, Development of	864
Deep v. Shallow Sowing	824
Dieback Disease of Apricot Trees	211, 425
" of Fruit Trees	915
Disc Harrowing of Lucern	808
Diseases of Wines	431, 868
Distilleries, Annual Report on	515
Drainage	299
Dried Fruit Moth, Parasite of	1029
Drilling and Manuring	164, 408, 616, 666
Drought, Lessons from	1013
Duke of Cornwall, Presentation Address to	898
Egg-stealing Dogs	880
Eggs, Export of, from Egypt	596
" Preservation of	10
Ensilago	76, 168, 253, 296, 467, 716, 916, 1021
Evaporating Machines, Temperature of	520
Export Butter Trade	801
" Fruit for	614
" of Low Grade Butter	95
" of Staple Products	724
Fallow, Manuring of	70
Fallowing	55, 76, 147, 176, 677, 1006
" Early and Late	1003
" with Six Horses	1006
Fallows, Winter Working of	919
Farm, Economising Labor on	222
" Economy on	476
" Experiment	776
" Hints	26, 102, 269, 346, 452, 521, 586, 649, 713, 881, 984
" Life	1028
" Making Attractive	656, 930
" Advantages of	153

	Page.
Farm Management	368
“ Notes on	683
“ Remarks on	391
“ Sheep on	65, 917, 922, 924
“ Stock	66, 172
“ Vegetables on	922
“ Work, Best Horses for	1007
Farmer, The Practical	738
Farm, (Carrying Capacity, Improvement of	840, 913
“ Visits to	498, 499
Farming	1016
“ and Grazing	493, 904
“ in South Australia (Lowrie)	745
“ Observations on	655
“ Old and New	470
“ on the Murray Flats	382
“ under Improved Methods	830
“ Reasons for not Paying	376
Farmers' Co-operative Union	542
Feed v. Breed	492
Fence-breaking Bulls	344, 391, 719
Fence Posts, Boring	65
Fertiliser, Salt as	170
Fertilisers Act	456
“ Analysis of	877
“ and Bunt	546, 674
“ “ Seed	175
“ Drilling with	164, 408, 616, 666
“ Effects of	606, 608
“ “ on Grasses	607
“ Experiences with	605
“ Experiments with	457, 610, 646, 770, 845, 846, 880, 938, 1032
“ for Fruit Trees	107, 393, 549, 760
“ for Orchard and Vineyard	51, 393
“ for Potatoes	876
“ for the Far North	328
“ for Wheat	798
“ Importation by Government	250
“ in Dry Districts	301
“ Inspection and Sampling of	267
“ Killing Wheat	44
“ Mixing	35
“ Quantity to Use	1030
“ Railway Carriage of	252, 374, 595, 819
“ Shortage in	848
“ Unit Value	42
“ Use of	475, 600, 658, 818, 846, 969, 1030
Field Peas, Cultivation of, and Harvesting	302
“ Trial at Bute	139, 172
“ “ Murry Bridge	293
“ Trials	901
Fig Drying on a Small Scale	575
Figs, Pickled	648
“ Smyrna	35, 290, 375
Finance and Cultivation	479
Fishy Butter	79, 638
Flies, Getting Rid of	534
Flour Storing	58
“ Testing	397
Fodder Bushes and Grasses	49, 306, 540
“ Crops	43, 736
“ Grasses	49, 306, 540
“ in Seasons of Drought	212, 408
Forage Plants, Annual	819
Forest Trees	71
Forests, Conservation of	719
“ Effects of Destruction of	986
Foxes	1021

INDEX.

	vii. Page.
Foxes, Poisoning	332
Frost Affecting Wheat Plants	290, 494, 903
Fruit Cars	672
“ Culture, Extension of	383
“ for Export	614
“ Growing	171, 304, 668, 934
“ “ in the Hills	543
“ Pests	165
“ Preserving	691
“ Trees, Dieback Disease of	211, 425, 915
“ “ Fertilisers for	107, 393, 549, 760
“ “ Irrigation and Cultivation of	680
“ “ Pruning	151, 1004
“ “ Transplanting	1015
“ “ Treatment of Nonbearing	768
“ “ Old, Pruning and Renovating of	364
Fungicide, Saccharate of Copper as	82
Fungus Pests -	
Bitter Pit in Apples	842
Black Rust in Wheat	315, 469, 833
Bunt in Wheat (<i>see</i> Pickling Seed Wheat)	49, 66, 489, 499, 538, 694, 827, 923
Curl Leaf	37, 493
Dieback Disease of Fruit Trees	211, 425, 915
Potato Scab	672
Takeall	65, 155, 167, 236, 381, 473, 548
Wheat Stem Killing Fungus	521, 593, 606
Gates, Wire	65
Gnawing Insects, Poison for	103
Goose	77, 377, 606
Grafting Wax	108
Grain, Bulk Handling of	45
Grape Jam or Jelly	648
Grass Fires	840
Grazing	493, 904
Green Manuring, Plants for	82
Grubs in Root Crops	71
“ in Wheat	163, 166
Gutterpercha	286
Hams, Curing	412
Hand-feeding of Cows for Milk and Butter Production	945
Hard Butter	807, 867
Harvest Machinery, Evolution of	167
“ Results	603, 611, 612, 693
Hay Growing and Management	227, 295, 601
Header, The	482
Herb-growing	1036
Hessian Fly	537
Hillside Washes, Preventing	837
Hogs, Ringing	21
Homestead Meetings	62, 78, 178, 303, 378, 392, 399, 403, 480, 489, 491, 498, 499, 548, 608, 610, 683, 775, 835, 836
Homesteads and their Surroundings	598
Horseradish, Cultivation of	19
Horses, Breeding of	46, 337, 466, 550, 558, 597, 900, 907, 1007
“ Character of	462
“ Collars for	295
“ Complaints in	401, 760
“ Greasy Heels	911
“ Mange	285
“ Sore Shoulders	145
“ Worms in	22
“ Feeding of	53, 68, 607, 822, 847, 853, 929
“ Improvement of	180, 217, 931
“ Molasses or Sugar for	375
“ Oats for	610
“ Treatment of	146, 677, 688, 769, 849, 921
“ Watering of	615, 756, 761, 853, 930, 1004, 1017
“ Wheat Foundered	541

	Page.
Horticultural Notes	107
Horticulture	734
" Some Notes on Victorian	517
Household Hints	508
Illustrations—	
Ant Puzzlers	333
Apples for Export	576
Attemperateurs in Wine Fermentation	566
Beurre Gifford Pear	582
Bulls, Taming	719
Cherries, Packing for Intercolonial Export	528
Cow Rugs	960
Cultures, Butter Organisms	806, 866
" Contamination of Dairy Produce	260
" Cream Organisms and Hurtful Germs and Moulds	866
" Fishiness in Butter	802
" Milk Organisms	965
Dieback Disease of Apricots	426
Diseases of Wines	871
Emden Goose	6
Fence-breaking Bulls	344
Fertilisers for Wheat	327
Flies, Ridding the House of	534
Grading Milking Herds	966
Indian Runner Duke	279
Nectarine, Early Rivers	582
Orpington Fowl	277
Pears, Early Ripening	582
" for Export	704
Peas, Wire-netting Supports for	710
Pickling Seedwheat	715
Pile Leghorn Cock	330
Poultry Yards and Houses	568
Prune, Tragedy	582
Sand Drifts, Arresting	629
Tick Traps	333
Tomatoes, Trellising	584
Toulouse Gander and Goose	275, 276
" Wilder," Pear	582
Wyandotte Fowl	278
Implements, Care of	74, 75, 841
Indian Remounts	408
Indiarubber and Guttapercha	286
Insect Pests -	
Aphis	70, 161, 181, 1021
Beetles, Poison for	108
Bot Fly	394, 488, 523, 610
Caterpillars in Wheat	163, 166, 294, 313, 377, 675
Codlin Moth	140, 142, 615, 678, 734, 762, 819, 829, 832, 834, 837, 843, 846, 896, 898, 909, 920, 931, 936, 998, 1001, 1035
Curculio Beetle	536, 843, 928
Grubs in Root Crops	71
Locusts	313, 386, 389, 472, 474, 526
Lucern Pest	18, 56
Night Caterpillars	693
Red Spider	380
Smynthurus in Lucern	18, 56
Irrigation	544, 680
" and Summer Cultivation	669
Karoo Bush	71
Land Cultivation	62
" Improvement of	298
" Working	926
Labels, Paste for	726
Lambs, Export of	114, 379
Lemon Curing	1014
Lentil Soup	187

INDEX.

	ix.
	Page.
Limewash	816
Locust Destruction	313, 386, 389, 474, 526
Locusts and Drought	472
Lucern, Cultivation of	104
“ Disc Harrowing of	808
“ Springtail (Pest)	18, 56
Mallee Lands, Cultivation of	641
Mange, Alleged Cure for	285
Mangolds	306
Manitoba Wheat	384, 538
Manure Vendors' Circulars	968
Manured Crops and Dry Weather	486
“ Land, Hay from	918
Manures, Alleged Injury from	748
“ and Grass	924
“ and Manuring	821, 902
“ Application of	386
“ Drilling with	164, 408, 616, 666
“ Experiments with	497, 605, 610, 646, 770, 835, 845, 938
“ “ in Canada	880
“ Mixing	306
“ on Limestone Country	547
“ Results at Roseworthy College	646
“ Unreliable	390
“ Use of	921
Manuring in Dry Climates	253
“ of Fruit Trees	107, 393, 549, 760
“ “ and Vines	51, 393
“ of Wheat	798
Meat, Export of	114
Medicine, Administration of, to Animals	334
Melon and Quince Jams	509
“ Fruits from Old Seed	816
Middleman, The	894
Mildura Notes	457, 531, 574, 650, 792
Military Remounts, Qualifications of	98
Milk, Aeration of	558
“ Fever	67
“ How to Keep Sweet and Cool	562
“ Pasteurised	260
“ Quality of	564
“ Testing at Factories	560
Modiola decumbens	1034
Mule Breeding	340
Mushroom-growing	97
Mustard Seed	875
Mylor Typical Orchard	429
Native Cabbage	843
Nectarine, Early Ripening	582
New Wheats	487, 491
Night Caterpillars	693
Ninety-Mile Desert, Testing the	905
Nitrate of Soda	375
“ for Market Garden Crops	972
“ for Potatoes	537
Nitrogen, Profitable Source of	565
Noxious Weeds Act, &c.	481, 602, 821
Oats	752
Olive, Hardy's Mammoth	999
“ Cultivation	750
“ Pickling	787
Onion Cultivation	464
“ Maggot	376
Oranges, Exporting	114, 116
Orchard, Best Place for	975
“ and Vineyard, Care of	464
“ Bees in	653
“ Fertiliser for	51, 393

	Page.
Orchard Notes (Geo. Quinn)	14, 100, 271, 358, 446, 511, 572, 702, 791, 983
Orchards, Poultry in	524, 863
Osier Cultivation	641
“ Our Boys and Girls”	36
“ Our own Interests”	828
Outlook in the Upper North	477
Paint, Cheap	292
“ Fireproof	118
“ for Fences and Sheds	118
Paspalum dilatatum	898, 1032
Peach Aphid	70, 161, 181, 493, 1021
“ Curl Leaf	37, 493
“ Tree, Results of Constriction of	685
Peaches, Crystallised	509
Pears, Early ripening	583
“ Export of	115, 703
“ Long-keeping	915
Peas, Cultivation and Harvesting	302
“ Value of	925
“ Wire-netting Supports for	710
Pedigree Stock, High Prices of	539
Phosphate Deposits in the North	974
Phosphates, Reward for Discovery of	28
“ Use of, in Europe	971
Phosphorus Poisoning, Antidote	641
Phylloxera	484
Pickling Seed Wheat .. 715, 753, 758, 762, 824, 826, 834, 927, 929, 1028, 1031, 1034	
Pig Breeding and Bacon Curing	171, 397, 402, 823, 844, 914, 964, 1023
“ Keeping	150
Pigs, Abortion in	496
“ and Bacon	303
“ Best Kinds of	157
“ Feeding	78
“ Killing	907
“ Partial Paralysis of	81
“ Turpentine for	790
Pinnaroo Country	1017
Plant Foods	34, 155
“ Removal of, by Crops	932
Plants, Regulations on Importation of	727
Plough Wheels, Sand in	409
Ploughs, Cleaning	887
“ with Seed and Fertiliser Drill	392
Plum Jelly	508
Plums, Canned or Bottled	508
Poison, Antidote for Phosphorus	541
“ in Potatoes	375
Poisons, Arsenic, &c.	800, 977
“ for Beetles	108
“ for Foxes	332, 1021
“ for Gnawing Insects	108
“ for Rabbits (<i>see</i> Rabbit Destruction)	
“ for Small Birds	109
“ Method of Laying	978
“ Mixing	976
“ Phosphorised Oats or Wheat	976
“ “ Pollard	976
“ Strychnine, &c.	53, 977
Pork, Dry Curing of	815
Potato, Deterioration of	536
“ Growing	162, 309, 406
“ Scab	672
“ Setts, Sprouted <i>v.</i> Non-sprouted	596
Potatoes for Stock	156
“ Manures for	171, 428
“ Manuring and Working after Planting	672
“ Nitrate of Soda for	537
“ Planting	471

INDEX.

	xi.
	Page.
Potatoes, Planting, Size of Cut Tubers for	596
Poultry Breeding	911
“ Business, Possibilities in	1010
“ Chickens, Rearing of	388
“ Complaints	469
“ “ Remedies and Treatments	525
“ “ Roup	853
“ “ Tick	148, 606, 671, 677, 848
“ “ Turkey Turning Blind	861
“ Co-operation	571
“ Cost of Production	862
“ Embden Goose	6
“ England's Egg and Poultry Bill	721
“ Exercise for	861
“ Feeding	39
“ Fowl Catching	571
“ in Hills	759
“ in Orchards	524, 863
“ Incubators	864
“ Industry	59
“ “ of Russia	118
“ Minorca	523
“ Moulting	645
“ Notes (D. F. Laurie)	6, 93, 274, 329, 449, 523, 567, 644, 721, 794, 861, 992
“ Rearing	40
“ Shows	644
“ Victorian Stud Farms	794
“ Yards and Houses for	567
Practical Farmer	738
Prevention is Better than Cure	745
Prickly Pears for Fences	912
Produce Export Department Reports	114, 979
Products from Small Holdings	497
Professor Lowrie and Agricultural College	817
“ Resignation of	999, 1024, 1026, 1031, 1035, 1036
Prune Curing in France	107
“ Early Ripening	583
Pruning	308, 936
“ Demonstration	1018, 1032
Public Schools and Rural Instruction	170
Quinces, Uses of	509
Rabbit Breeding	69
“ Destruction	314, 384, 472, 475, 484, 498, 550, 600, 601, 605, 639, 664, 764, 770, 775, 838, 919, 1031
“ Export of	114
“ (Poisoned) and Cattle	755
Rail Freights on Fertilisers	897
Rainfall Comparison	188
Rats, Catching	475
Reapers, Trial of, at Crystal Brook	486
Red Spider	380
Reference Libraries	670
Reservoir, Cleaning	1013
Rhubarb Jelly	509
Rib Grass	162
Rick Cloths, Waterproof for	272
Ricks, to Measure	292
Rock Phosphates, Sources of	40
Rural Industry at Public Schools	170
Salt Patches	74
School Gardens	785
Scrub, Utilisation of	542
Seed and Fertilisers	175
“ Experiments	71, 72, 73, 77, 79, 142, 144, 145, 149, 150, 151, 161, 162, 163, 169, 174, 175, 176, 183, 295, 296, 297, 305, 306, 309, 377, 379, 389, 392, 406, 476, 495, 918, 937, 1000
“ Change of	548, 550

	Page.
Seed, Old and New	481, 547
“ Wheat, Cleaning	52
“ “ for Distressed Farmers	540, 599, 601, 610, 830
“ “ Pickling	715, 753, 758, 762, 824, 834, 927, 929
“ “ Preparation of Land for Reception of	238, 689, 761, 825, 912
“ “ Shrivelled & Plump Grain	775, 753
“ “ Quantity to Sow per Acre	142, 179, 826
“ “ Selection of	152, 848
“ “ Sowing, &c.	761, 829
Seeds for Experiments	290
Sheep and Wheat on the Murray Flats	732
“ and Wool	467
“ Breeding	56
“ “ and Management in Lincolnshire	478
“ Dipping	395
“ Effect of Salt on	444
“ Earmarking	159
“ Farming	846
“ Feeding	833, 1020, 1036
“ “ during Dry Seasons	1034
“ “ with Chaff	923
“ for Farms	149, 676, 772
“ for Northern Farms	667
“ Improvement of	851
“ Lice in	22, 23, 1020
“ Management of	465
“ Merino	307
“ Most Profitable for Gladstone District	659
“ On the Farm	65, 917, 922, 924, 1005, 1006, 1015, 1016, 1019, 1029
“ Ticks and Lice in	22, 23, 1020
“ Winter Green Feed for	174
“ Worms in	22, 159
Silos	916
Skim Milk for Calves	21
“ “ Product, A New	535
Small Birds, Poisons for	109
“ Holdings	614
Smynturus	18, 56
Soil Cultivation	398, 675
“ Moisture of	756
“ Preparation of, for Reception of Seed	238, 689, 761, 825, 912
Soils, Alkali	72
“ and Fertilisers	165, 372
“ Chemical Analysis of	541
Soursops	72, 303
South Australian Farmers' Co-operative Union	105
Sparrows	765, 832
Spraying	57, 108
“ for Profit	37
Stallions, Licensing of	140, 145, 167, 176, 179, 375, 395, 403, 536, 597
“ “ Subsidy to Branches for Purchase	181
Starlings	616
Stinkwort	842
Stock Assurance	609
“ Bone Meal for	922
“ Complaints	53, 73, 401, 678, 681, 739, 760, 771, 822, 910
“ “ Abnormal Heart	1020
“ “ Abortion in Cows	1026
“ “ Anthrax	455
“ “ Bloat	42, 978
“ “ Calculus	1020
“ “ Coast Disease	767
“ “ Greasy Heels in Horses	911
“ “ Hoven	42, 978
“ “ Impaction of the Omasum	542, 607, 753, 765, 838, 854, 909, 1016, 1019
“ “ Instruction on	609
“ “ Ophthalmia in Horses	75
“ “ Sore Shoulders on Horses	145, 1006, 1017

INDEX.

xiii.

Page.

Stock Complaints, Strangles	850
“ “ Warts on Cows' Teats	79
“ “ Worms in Horses, Sheep, and Cattle	22, 159
“ “ Pigs	389
“ Contagious Diseases in Great Britain	82
“ Drinking Water for	1025
“ Importation of	549
“ Notes	22, 454, 55, 811
“ Potatoes for	156
“ Railway Carriage of	255
“ Saving Straw for	407
“ Trains	924
Strippers	314
“ Field Trial of	490
Strychnine	53
Stubble Burning	602, 854
Stump Carting	68
Sugar Beet	187
Sulla	78
Sulphate of Ammonia	375
“ Iron for Sheep	167
Superphosphate	717
“ and Dry Weather	926
“ Arsenic in	800
“ Packages for	915
“ Quantity per Acre to Use	851
Surplus Produce, an Outlet for	660
Takeall	65, 155, 167, 236, 381, 473, 548
Tanglefoot	363
Tanks, Construction of	669
Tethering Stock	375
Thick and Thin Sowing of Wheats	462, 678, 882
Thomas Phosphate, Experiments with	596
Threshing Machine	174, 495
Tick Traps	333
Tobacco Tree as Shelter Belts	77, 377
Tomato Growing	919
Tomatoes, Horizontal Training of	583
Tools, Care and Repair of	74
“ Sharp and Blunt	926
Travellers' Records	923
Tree Planting	65, 182, 401
“ Big Money in	590
Trees, Grubbing	64
Trials and Troubles of the Northern Farmers	60
Tuberculin	759, 809, 839, 891, 932
Tuberculosis in Pigs	345
“ Udder	159, 394, 488
Turkestan Lucern	464
Turnip, White Milan	52, 61
Vegetable Notes (Geo. Quinn)	16, 101, 273, 357, 448, 510, 571, 711, 794, 982
Vermin Destruction	976
Vine Planting	141
Vinegar, Cider	1020
“ What is ?	118
Vineyard, Cultivation of	691
“ Fertilisers for	51, 393
“ Notes (Professor Perkins)	112, 283, 353, 786
Water, Provision on Farms	910
Wattle Growing	933
Weeds	496, 763
“ Barnaby Thistle	162
“ Blennodia sp.	763
“ Buttercups	394
“ Charlock	470, 596
“ Cockspur	842
“ Deadly Nightshade	910
“ Drummond Spurge	687
“ Extermination of	384, 842

	Page.
Weeds, <i>Homeria collina</i>	325, 393
“ <i>Hypericum Canariense</i>	543
“ Poppy	843
“ Soursops	72, 303
“ Stinkwort	842
“ Water Hyacinth	105
“ Wild Oats	470
“ “ Onion	314
Weevils	82
Wellington Lodge Station, Visit to	348
Wheat and Caterpillars	163, 166, 294, 313, 377, 675
“ Bags as	650, 683
“ “ Size of	46, 158
“ Best for Flour	837
“ Black Rust in	315, 469, 833
“ Blighting of	935
“ Cleaning	483
“ Crops, Harvesting	154, 396
“ “ “ in Dough State	774
“ Cross Pollination of	50
“ Diseases of	75, 671
“ Early and Late Sowing of	79
“ Experiments	73, 147, 149, 151, 163, 296, 400, 411, 470, 473, 474, 478, 489, 495, 496, 538, 546, 548, 549, 597, 599, 600, 603, 608, 609, 613, 615, 674, 677, 678, 679, 682, 686, 689, 754, 758, 763, 766, 771, 774, 821, 824, 825, 830, 832, 837, 838, 920, 921, 928, 938
“ “ in Ninety-Mile Desert	828, 835
“ Feeding Down	61
“ for Distressed Farmers	691
“ for Hay	1006
“ for Seed	901
“ for Trial	716
“ Frosthitten	290, 494, 903
“ Growers, Unfortunate	508
“ Growing	471
“ Manitoba	384, 538
“ Pests	158
“ Plump v. Shrivelled Grain	822
“ Test of Varieties	469
“ Thick and Thin Seeding	462, 678, 882
“ Standard Average Sample	44, 50, 57, 64, 67, 70, 162, 178, 215, 299, 315, 378, 409 544, 550, 596, 679
“ “ Bushel Conference	123
“ Steinwedel	383
“ Stem-killing Fungus	521, 593, 606
“ Storing	58
Wheats and Manure	297
“ Improvements of	749, 772
“ Most Suitable for Districts	395, 475, 602, 677, 767
Wheels, Preservation of	20
Wilder Pear, Early Ripening	583
Wind Breaks	937, 944
Wine and Cellar Notes (Professor Perkins)	118, 251, 281
“ and Spirits, South Australian Output	515
“ Export of	114
“ Fermentation, Attemperateurs or Coolers in	566
“ Manufacture of	517
Wines, Diseases of	431, 868
Winter Irrigation	33, 139, 290
Woburn Experimental Fruit Farm	999
Wool	467, 731
“ and Wool-classing	247
“ Classes	842
“ Shipments	50
Worms in Horses	22
“ Pigs	389
“ Sheep	22, 159
Zante Currant	165, 536, 851

REPORTS OF AGRICULTURAL BUREAU MEETINGS.

	Page.
Albert	47, 152, 180, 909, 1003
Amyton	65, 168, 404, 483, 692, 756, 907
Angaston	52, 308, 406, 464, 475, 773, 851, 1035
Appila-Yarrowie	36, 60, 151, 378, 491, 604, 838
Arden Vale	80, 162, 402, 498, 692, 847, 1027
Arthurton	70, 178, 308, 392, 491, 774, 853
Auburn	49, 297, 385, 470, 616
Bakara	66, 182, 301, 407, 498, 690, 771, 853, 938
Balaklava	63, 173, 311, 499, 608, 689, 772, 844, 1034
Baroota Whim	147, 473, 681, 909
Belair	309, 920
Boothby	44, 163, 305, 386, 764, 829, 929
Bowhill	58, 179, 474, 675, 752, 828, 1030
Brinkworth	142, 170, 303, 400, 474, 615, 762, 826, 926, 1028
Burra	70, 152, 389, 486, 682, 842, 919, 1028
Bute	68, 172, 313, 407, 495, 764, 935, 1025
Caltowie	147, 400, 486, 821, 848, 1016
Carrieton	49, 179, 601
Cherry Gardens	64, 170, 306, 389, 488, 543, 604, 764, 832, 931, 1031
Clare	37, 65, 165, 467, 496, 750, 925, 1035
Clarendon	72, 183, 410, 615, 846, 1004
Colton	50, 158, 294, 387, 480, 760, 915, 1019
Cradock	39, 148, 301, 472, 919, 1007
Crystal Brook	56, 184, 315, 408, 490, 599, 691, 851, 930, 1023
Davenport	73, 176, 405, 680, 901, 1030
Dawson	41, 180, 297, 401
Dowlingville	40, 153, 469, 850, 938
Elbow Hill	44, 304, 804, 914
Eudunda	170, 395, 485, 597, 687, 763, 921, 1012
Finniss	71, 183, 397, 495, 605, 694, 938, 1025
Forest Range	55, 164, 299, 538, 754, 829, 906, 1004
Forster	58, 162, 488, 541, 603, 687, 769, 910, 1016
Gawler River	78, 151, 396, 606, 679, 763, 848, 1029
Gladstone	37, 173, 293, 394, 600
Golden Grove	64, 161, 305, 385, 386, 481, 547, 612, 773, 834, 915
Gumeracha	43, 184, 302, 383, 478, 676, 752, 838, 909, 1020
Hahndorf	142, 304, 387, 678, 759
Hartley	146, 303, 475, 757, 921
Hawker	61, 150, 384, 677, 825, 912
Holder	143, 150, 297, 478, 675, 753, 830, 914, 1015
Inkerman	62, 184, 407, 492, 597, 615, 764
Johnsburg	55, 175, 313, 408, 477, 601, 770, 845, 1015
Kadina	174, 760, 910
Kanmantoo	59, 307, 597, 758, 837, 930
Kapunda	42, 154, 294, 396, 480, 688, 755, 840, 913, 1024
Koolunga	182, 494, 546, 674, 768, 837, 911, 1007
Lipson	74, 162, 310, 547, 609, 679, 853, 926
Lucindale	70, 149, 298, 379, 598, 762, 821, 913, 1020
Lyndoch	387, 464
Lyrup	70, 302, 392, 611, 694, 1030
Maitland	78, 169, 401, 824, 835, 1013
Mallala	51, 172, 487, 608, 761, 1018
Mannum	40, 155, 473, 679, 842, 900
Meadows	42, 144, 482, 539, 837, 1023
Meningie	79, 390, 497, 765
Millicent	156, 380, 389, 485, 540, 683, 766, 840, 1010, 1032
Minlaton	72, 179, 469, 491, 682, 690, 1030
Morgan	53, 598, 686, 766, 822, 903, 1014
Morphett Vale	56, 141, 379, 917
Mount Bryan East	59, 177, 391, 471, 601, 827, 937, 1036
Mount Compass	71, 171, 388, 474, 543, 612, 681, 763, 843, 937, 1031
Mount Gambier	67, 159, 394, 487, 499, 544, 609, 686, 759, 839, 924, 1020
Mount Pleasant	51, 163, 291, 409, 476, 766, 836, 925, 1029
Mount Remarkable	52, 155, 295, 380, 470, 541, 677, 758, 835, 916, 1017
Mundoora	64, 178, 314, 383, 538, 678, 823, 922, 1017

	Page.
Murray Bridge	48, 151, 293, 384, 676, 774, 835
Mylor	41, 316, 407, 472, 827, 918, 1021
Nantawarra	52, 149, 299, 381, 476, 542, 602, 675, 762, 827, 912, 1008
Naracoorte	77, 183, 377, 406, 480, 606, 683, 775, 849, 932, 1036
Narridy	42, 144, 298, 385, 673, 771, 846, 931, 1022
Norton's Summit	175, 301, 381, 496, 900
Onetree Hill	48, 167, 396, 482, 546, 602, 685, 833, 923
Orororo	69, 180, 392, 405, 480, 687, 769, 1024
Paskeville	145, 395, 755, 915
Penola	62, 148, 313, 403, 693, 762, 849, 925, 1024
Petersburg	173, 472, 905, 1017
Pine Forest	73, 75, 174, 378, 411, 494, 548, 610, 677, 776, 901, 935
Port Broughton	69, 173, 402, 612, 1018
Port Elliot	71, 165, 316, 398, 493, 644, 618, 691, 775, 850, 1031
Port Germein	67, 171, 397, 613, 847, 1003, 1026
Port Lincoln	76, 770, 1031
Port Pirie	73, 161, 679, 754, 832, 904, 1006
Pyap	61, 181, 309, 493, 682, 769, 1024
Quorn	40, 143, 296, 399, 755, 823, 907, 1006
Redhill	57, 161, 307, 392, 678, 846, 901, 1007
Renmark	41, 64, 173, 393, 484, 549, 681, 760, 1014
Rhine Villa	376, 382, 470, 539, 752, 906, 1016
Richman's Creek	51, 163, 295, 403, 675, 757, 824, 922
Riverton	74, 180, 314, 404, 496, 611, 691
Robertstown	63, 162, 311, 495, 920, 1013
Scales Bay	75, 163, 294, 377, 927
Stansbury	51, 166, 306, 549, 612, 765, 850, 937, 1036
Stockport	44, 149, 842, 854
Strathalbyn	54, 177, 603, 681, 933, 1026
Swan Reach	77, 146, 295, 382, 1010
Tanunda	57, 58, 160, 406, 489, 691
Tatiana	68, 176, 293, 477, 542, 828, 1018
Wandearah	58, 482, 602, 760, 761, 909, 1005
Watervale	66, 158, 307, 483, 514, 603, 698, 843, 928
Willunga	39, 1034
Wilmington	48, 145, 296, 393, 471, 540, 600, 681, 755, 830, 913, 1008
Wilson	89, 171, 391, 474, 550, 601, 822, 931
Woodside	76, 391, 774
Woolundunga	303, 472, 918
Yankalilla	393
Yorke town	68, 176, 310, 398, 686, 772, 838, 932, 1022

INDUSTRY.

	Page.
Broken Hill Proprietary Smelting Works, A Visit to the	83
Dunedin Saddlers' Dispute	193
English Factories Acts, General View of	85, 190, 317, 414, 501, 618
English Factories and Workshops, Report on	319
Factories Acts, The	778, 855, 939, 1037
Labour Bureau	83, 190, 317, 414, 501, 618, 696, 778, 855, 939, 1037
Safeguarding Crank of Gas Engine	619
Seats for Shop Assistants	88
What Work is	418
Working Girls' Club	1039

Journal of Agriculture

AND

Industry.

No. 1. REGISTERED AS

AUGUST, 1900.

[A NEWSPAPER. VOL. IV.]

NOTES AND COMMENTS.

July on the whole has been favorable to the growth of the crops and feed, though the fall of rain recorded has not been large. Throughout the month showery weather has been experienced every few days, and, although the middle of the month was cold and bleak in many parts, no serious check to the growth of vegetation was experienced. The West Coast districts have again been favored with good falls of rain, as will be seen from the rainfall tables. On the whole the crops continue very promising, and should we get a good soaking rain early in August the hopes of the wheatgrowers will be raised. Feed generally is plentiful, reports on the lambing in the settled districts favorable, and a good dairying season almost assured. Milk is rapidly becoming plentiful, and the first mail steamer leaving in August takes a small shipment of butter to London.

Mr. W. Vollprecht, Warracknabeal, Victoria, wrote the *Australian Farm and Home*, giving his experiences with bonemeal for prevention of impaction of the omasum in dairy cows. He was led to try this because Stock Inspector Cotter had expressed the opinion that impaction was due (on this farm) to the absence of phosphates in the soil, and recommended pure bonemeal as a preventive. Half a bucket of bonemeal was placed in a box in the cow paddock, and after a time the cows began to lick it up. Since then the cows have been in splendid health, the improvement in the hair, skin, and brightness of eyes being remarkable. Molasses and chaff are also given in cold weather. Dissolve 6lbs. of molasses in 5galls. boiling water, and sprinkle over 80lbs. chaff, to be afterwards used as a feed for twelve cows. Members of Branches of the Agricultural Bureau should try this remedy and report results through the journal.

A great many people think they have a right to do as they like with their own land; but this is a great mistake. No man has any right, for instance, to grow a crop which, by scattering its seeds over adjacent lands, is liable to injure the neighbors. No man is justified in growing thistles, or neglecting to suppress them, if the seeds are likely to cause infection of adjacent properties. The same remarks apply to all diseases of plants and of animals—no one is justified in neglecting to suppress them on his own property if, by reason of such neglect, the neighbors are injured or liable to be injured.

Skim milk is now utilised largely in the manufacture of a perfect substitute for celluloid, and does not possess the objectionable property of being highly inflammable. It is also used for making paper sizing, of which quite 6,000 tons are annually used. The new "celluloid" substitute can be used for oilcloth, bookbinding, combs, billiard balls, or anything where hard rubber or celluloid is employed. Mixed with fine or coarse meals in place of water, and baked as bread or biscuits, skim milk can be largely used as food for men or for the lower animals.

In connection with the alleged injurious effect of muriate of potash upon potatoes some results obtained at the Virginia, U.S.A., Experiment Station are of value. For a period of three years experiments to test the effect of fertilisers upon the quality of the potatoes were carried out, and the results are summed up to the following effect:—"It can therefore safely be said, in summing up the evidence as given of these results, that fertilisers have very little effect upon the starch content. The starch does not seem to be affected much by either the large or small application of fertilisers, nor does it make much difference whether we use muriate or sulphate of potash." This latter point is of great importance to South Australian growers, as 1lb. of pure potash in muriate costs 2d. per pound, while in sulphate of potash the potash costs 3d. per pound, a difference of 50 per cent. In the plots receiving muriate the potatoes contained 69.99 per cent. of starch, while in the sulphate plots the tubers contained 69.35 per cent.

Experiments in manuring of wheat carried out over a period of four years at the Virginia, U.S.A., Experiment Station give remarkably similar general results to such experiments in South Australia notwithstanding the variations in soils and climates. The results of the Virginia experiments are summed up as follows:—Considered from a financial standpoint the results for the whole four years show that nitrogen and potash used alone, or combined, have regularly resulted in loss. Phosphoric acid by itself has proven more profitable than phosphoric acid, nitrogen, and potash combined, though the yield per acre has been a little less than from the mixture. The greatest profit resulted from the combined use of phosphoric acid and potash.

It is necessary to repeat certain truths very often. Many people fail to remember facts that are of great importance to them. All farmers should know that bones—"rock phosphates," "mineral phosphates"—and most natural phosphatic fertilisers contain a superabundance of lime. By crushing these substances, and adding sulphuric acid, a large quantity of the lime is removed from its combination with the phosphoric acid, and is incorporated with the acid, forming gypsum. But the phosphoric acid is still combined (as "superphosphate") with an equal portion of lime, and in this form it is readily dissolved by water, so that when sown along with the seed it is quickly available for the use of the plants. Bonedust, Thomas phosphate, mineral phosphate, &c., can be only very slowly dissolved in the soil by aid of the roots of plants. Now, if lime in any form is mixed with the superphosphate, it is taken up by the phosphoric acid in the "super." and causes a rapid "reversion" to the original insoluble form. For this reason superphosphate must not be mixed with bones or bonedust, Thomas phosphate (or basic slag), lime in any form, nitrate of soda, or

wood ashes. Limestone soils, or marls, or even ordinary soils will cause supers. to revert to their original insoluble condition very soon, but the fertiliser will have become so finely distributed amongst the soil that the plants can readily take hold of them by aid of the acids from their roots. Super. may be mixed with sulphate of ammonia, kainit, or potassium salts. Nitrate of soda may be mixed with Thomas phosphate, but not with sulphate of ammonia or any ammoniacal salt.

Where there is good drainage in the orchard or vineyard, so that it will not be converted into a swamp, great results may be gained by flooding for a few hours during August. In some places the water might be turned into the orchard or vineyard from an adjacent road or from a creek. Stagnant water, however, will kill any plant that is usually cultivated.

Many amateur fruitgrowers are not aware that air is as necessary to the roots of plants as it is to the leaves. In the wet season, called "winter" here, the roots still continue to grow, and many hair-like roots are produced, and their office is to gather food from the adjacent soil. When this soil becomes waterlogged, through excess of rain and absence of sufficient drainage, all the air is forced out, and within about eighteen hours the fibrous roots are suffocated or drowned. When spring arrives very few (if any) leaves are produced, the tree dies at top or altogether, and the dead roots develop a sour odor and a soft rotten condition of the bark on them.

If it ever happens that the tobacco and soap decoction fails to prevent damage to peach trees by the peach aphis, or if the Bordeaux mixture fails to prevent injury through curl-leaf, shot hole, or scab to peach, apricot, apple, or pear trees, the failure is due to some fault or circumstance attending the application, and not to the decoction or mixture itself. Of course, the mixture or decoction may be wrongly made, or may contain the wrong proportions of ingredients. For peach aphis the decoction must be applied when the sap begins to rise, just when the insects leave the root and climb to the branches, some time before the buds swell. Bordeaux mixture must be used, winter strength, just before the buds open into bloom, and the summer strength after the petals drop from the flowers. Use sprays during cloudy weather; repeat at once if rain falls, and never spray whilst the flowers are on the trees.

Apple-growers should fumigate their storerooms with sulphur directly all the fruit has been removed, in order to kill the caterpillars of codlin moths. If the floor is of wood, or other inflammable substance, do not use metal vessels in which to burn the sulphur, as this may quickly eat through tin, &c., and set fire to the house. Place some charcoal in a large earthen dish on the floor, set fire to it, and then place stick brimstone on the fire, run away, and close the door. If the room is close enough to prevent access of fresh air, every living creature within will be killed. All fruit rooms should be built so that they can be fumigated, and they should be kept closed from September 1 till March 1, so that all moths may be kept in and starved.

Every codlin moth caterpillar found in a bandage or elsewhere has destroyed at least one apple, but if the tree had been properly sprayed the caterpillar would have been killed before it could have done any damage. Every female caterpillar that escapes being caught in the bandages or is allowed to mature will probably lay from forty to 100 eggs. Of these a large percentage will produce caterpillars, each of which again will destroy at least one apple, or pear, or other fruit. One caterpillar may produce forty for the next generation, 1,600 for the second, and 64,000 for the third, or 65,640 in the season. These will spoil 65,640 apples or pears at least. Will it pay to prevent this loss by thorough spraying to kill the first broods, and by bandaging and gathering all affected fruit thereafter?

The cabbage caterpillar (*Plutella cruciferarum*) is a terrible pest on the plant in spring. It eats holes in cabbage leaves till the whole plant is covered with perforations. The moth is about half an inch long, narrow when the wings are closed, dark grey, with a white strip from end to end on both wings along the back. The edges of the wings are covered with long silky hairs. The caterpillars are green, beset with short jet-black hairs, and nearly half an inch long, and they make a thin gauzy cocoon when about to change into moths. Gas lime, or soot, sprinkled on the leaves after swishing the caterpillars off has been partially successful in England. The best remedy is tar-water spray, but it is very difficult to get tar to mix with water. The only plan is to boil 5galls. of water in a large boiler and add 3ozs. tar drop by drop whilst violently stirring the boiling water. If the tar is added in bulk it will never amalgamate with the water. Spray under the leaves as well as above.

Some farmers cannot keep a number of cows owing to unsuitable climate, local conditions, want of fodder, absence of daughters who could attend to milking and dealing with the milk, or other disabilities. But there are very few farms where poultry cannot be kept, and there is a good deal of profit to be made where the poultry yard is managed intelligently. Pure breeds must be maintained for egg production, with frequent changes of male blood and careful culling of inferior birds. There is no need to breed for "feathers" or for show purposes. For table fowls there are always good prices to be obtained either in our own markets or in those of Great Britain. Mongrels are of no use for this purpose, but the first cross between two suitable pure breeds is almost universally approved. Dorkings and Orpingtons both are splendid table birds. Dorking and Indian Game cross give splendid results.

In view of the importance to the farming interests of the rearing of table poultry for local markets and for export purposes, would it be advantageous to offer substantial prizes at all country agricultural shows for table birds, both living and dressed, to be judged by acknowledged specialists in such matters, who should be requested to state wherein the points of excellence or of defects in each and every exhibit consist, such remarks to be written out and affixed to the exhibit to which they refer, for the instruction of the exhibitor and for the information of all beholders? "Broilers," that is, chickens eight to ten weeks old are very largely sold in America, and ducks of the same age are sold by tons in England. We do next to nothing of the sort in Australia. But why not?

In France the Government set the example of planting fruit trees by the roadside, and several communes in the departments followed the practice, which is extending largely. In Germany, Belgium, and the Duchy of Luxemburg the system has greatly developed. In Westphalia, in the Duchies of Baden and Saxe-Weimar, in Alsace-Lorraine, Switzerland, &c., the employés of the administrators of roads and bridges, and the road supervisors are instructed in fruit arboriculture. Wild cherries are grown in many cases, and the fruit is used in making wine, preserves, and for distillation. In some parts the chestnut is grown, in others walnuts, and in Normandy apples. The public revenues from these roadside cultivations is of considerable importance to the authorities controlling them.

Co-operation amongst farmer cattle-breeders was started some years since in Switzerland, and has extended into France, where there are now several hundreds of such societies. In practice the following is usually adopted:—Some fifteen or twenty persons in a parish combine to purchase a pure-bred bull, which becomes their collective property. A herd-book is opened, and each member is expected to register for service the name of at least one breeding cow of pure blood, recognised as such by a committee of experts. The finest of the calves thus procured are inscribed in the herd-book as breeding animals—the others are sold. The expert committee periodically inspects the breeding animals to see that they are well kept, and that the young animals are properly reared. By such means the value of the herd is materially increased, and the fact that an animal is entered on the registers of the society immediately enhances its value.

There were 23,651,695 hogs slaughtered at the principal slaughtering and packing establishments in the United States of America during the season 1898-99. Of these 3,016,675 were slaughtered at Chicago. The only part of the pig that cannot be utilised up to the present in America is the squeal.

PURCHASE OF DAIRY BULLS.

The Department of Agriculture will, under the following conditions, subsidise £1 for £1 (up to £12 10s.), amounts raised by Branches of the Agricultural Bureau for the purchase of pure-bred bulls. During the ensuing twelve months only a limited number of Branches can be assisted.

Conditions.

1. Bulls to be purchased subject to approval of some person representing the Department of Agriculture.
2. Bulls purchased with the assistance of the department to be available for reasonable use by the public, at a fee of not exceeding 5s. for service, preference to be given to pure-bred cows and good milkers.
3. Bulls purchased with the assistance of the department not to be removed from any district, or disposed of, without the consent of the Minister of Agriculture, within three years of date of purchase.
4. Records to be kept of cows served, and results of service, and reports of same to be furnished half-yearly to the Central Agricultural Bureau.

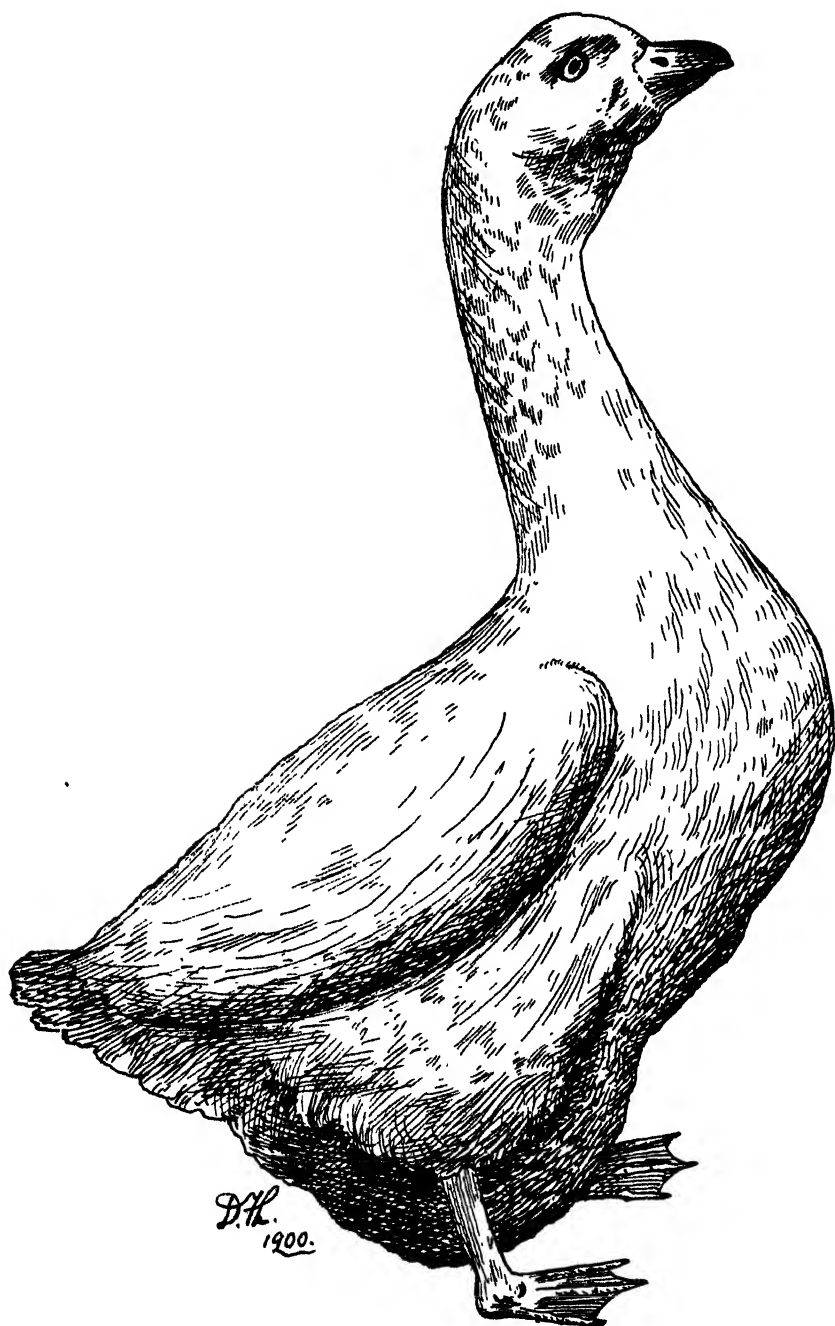
POULTRY NOTES.

BY D. F. LAURIE.

The Embden Goose.

On many occasions the urgent need of improving the size and quality of our geese has been my theme. On all hands it is admitted that even the pigmy, fleshless birds we generally see pay to breed, on account of the small amount of food they consume. It may be pointed out that it costs even less to breed larger birds, as, with proper attention to certain rules, the birds are stronger and fatten more readily. There is a considerable trade done with the Christmas goose, and more business would result if better birds were procurable. I know many people who decline to purchase the miserable specimens which do duty as table birds; they either buy ducklings or chickens, or go without poultry at that season. The general price is from 5s. to 6s., and the weight when ready for cooking is generally about 5lbs. or 6lbs., thus making the cost excessive. It would be an easy matter to produce prime goslings 10lbs. or 12lbs. in weight at the same cost. The subject of our illustration is an Embden gander.

Visitors to the Adelaide poultry shows of late years have seen some excellent specimens exhibited by Mr. A. J. Murray. In Victoria I have seen many fine specimens, Mr. Peter Briggs owning the finest. Like the Toulouse goose, the Embden grows to a great size and attains heavy weight. The great advantage of even an infusion of such blood is to increase the size of the progeny of ordinary geese. Of course the price for extra fine show specimens is high, but excellent birds can be purchased at a moderate figure, and they would be of great value in improving the size of the progeny if a pure gander were mated with a few of the largest common geese obtainable. It is essential that only mature geese of at least two seasons' growth should be bred from. It is a common practice to sell off the older geese and breed from yearlings; the results are that the consumer has a tough bird, and the progeny of immature geese are deficient in size and lacking in constitution. So, where the funds are limited, a start can be made by selecting the largest procurable common geese and mate with a pure-bred gander, which can be purchased in Victoria for about 50s. The progeny would be fairly large birds, as compared with the average run. I saw plenty of goslings in Victoria running in a paddock and averaging 15lbs. to 16lbs. weight. These were pure-bred and not nearly grown or feathered. In color the birds are pure white, no colored feathers being permitted, the bill is dark flesh colored, the legs and feet deep orange, and the eyes are light-blue and very bright; the contrast is marked. The carriage is erect and the bodies are square and reach well down in fattened specimens. A large fat specimen makes a satisfactory sound as it runs past you. Prime exhibition goslings reach 27lbs. to 30lbs. each, and old birds several pounds more, the average weight is, however, much less. If at two years the gander weighs anything over 20lbs. in good condition he should prove a fine stock bird; the goose would weigh about 15lbs. It is a well-known fact that geese, especially if fat, lose considerable weight during a journey of any sort; they fret, and also miss a liberal supply of water and food. As a rule the pure goose does not lay till after a year old; this is all the better, as laying too early stops growth, and besides the eggs are not wanted. It stands to reason, therefore, that young birds should not be mated, and every reasonable effort should be made to discourage early laying. The egg of the Embden goose is pure white, and of large size, with a rough, thick shell. The period of incubation is thirty days; turkeys or common geese should be employed for hatching, as it is seldom the practice to allow the pure birds to sit. All nests should be made



EMBDEN GANDER.

on the ground, and during dry weather and a week before hatching the ground round the nest should be kept moist to facilitate hatching. The goslings may be fed on meal in the same manner as ducklings, and must have plenty of green food, chopped onions, and clean water. A pond or creek is not necessary; only a small bath is required for them to wash in. I shall be pleased to advise any readers further in the matter. I do not think any two-year-old birds are procurable; still it is better to get young ones of last season's hatching in readiness for next year. Incubators of large size are very successfully used for hatching; the goslings are very easily reared. The cost of feeding where a large grass run is available is not very great. In England geese to be fattened are run on stubble land; they get fat at a nominal cost, and it is said the quality and flavor of the flesh is much better. Undoubtedly in the future we shall export prime goslings to England, but it will first be necessary to breed birds of the right description, and fatten them in the desired manner. Last year Messrs. Ebdy & Co. imported a few geese in the feather, frozen, and many who saw them were astonished at their size, while it was generally admitted that we could produce any quantity of similar birds if we had the stock. It was patent that common runts would not pay to send to a market where the purchasers were accustomed to high-class birds. Geese are bred very extensively in Russia, and at the great annual fairs many millions of birds change hands, large numbers going to Germany. Austria is also a great country for geese; they make also hams of the breast.

Seasonable Items.

The proof of the pudding is in the eating thereof. I am sometimes asked why I lay such stress on the utility points of certain breeds to the evident neglect of others. The answer is that we have all found by actual experiment that certain breeds pay better and give more satisfaction to both buyer and seller. Many disclaim against the "new-fangled" breeds as they call them; some even go as far as to say that because they are new they are of mongrel origin. Let us consider this latter point. Can anyone show me a breed which to-day is free from the suspicion of foreign blood? At what date are we to start from as a fixed period when a breed may be considered to have been pure? No time can be fixed, even if we inspect the remains of pre-historic birds and follow back the course of evolution. Brahmas and Cochins are not as seen in the early fifties. Leghorns, Minorcas, Game, Houdans, and others have varied in type; and, in fact, nearly all have more or less foreign blood which has at some time been introduced for a specific purpose. This is no mere assertion, it is, on the contrary, a well-known fact; and further, many far-seeing authorities are suspicious that too much "improvement" is still going on. Now, as regards the modern breeds, let us take three famous ones, Plymouth Rocks, Wyandottes, and Orpingtons. The first two hail from America, but for all that we are under a great debt to the breeders who founded both breeds. The third owes its origin to Mr. W. Cooke, of St. Mary's Cray, England, who is at present on a visit to the colonies. The Plymouth Rock is a very composite bird, owning many breeds as components, including the Java and Dominique (both of which in their turn are manufactures). In the various colors of Wyandottes and Orpingtons numerous breeds were requisitioned to produce the results we see. Where a new variety is bred and from whatever source, if it can be fixed so as to breed to type and color for successive generations, it is entitled to be ranked as a distinct breed. We know that lost qualities are often revived and regained by crossing, and it is this reason which gives the new breeds such hardy constitution and fecundity. If, after extended trial, a new breed proves to be of exceptional value, its virtues are recognised, and people are anxious to procure specimens. Of late years so much prominence has been given to the utility points of poultry that the average

breeder and owner of poultry are on the lookout for better and better paying breeds. The high-class breeder, the man who spends large sums in introducing the best specimens of various breeds, knows exactly what will suit the popular demand and caters accordingly. A good guide to popular breeds may often be found in the number of entries of the various breeds at big poultry shows. Take the entries for the Poultry Club of New South Wales show this season. We find 33 Dorkings, 54 Plymouth Rocks, 154 Orpingtons, 143 Wyandottes, 41 Langshans, 52 Indian Game, 114 Minorcas, 188 Leghorns. Without actual details it is hard to say which breed is really the best represented, probably two kinds of Dorking, three or four Wyandotte, two of Langshans, one of Indian Game, one of Minorca, and perhaps four of Leghorn will be represented, so that probably Indian Game and Minorcas head the list. For the forthcoming Victorian Poultry and Kennel Club's show we find the following items:—Dorkings, 48; Orpingtons, 100; Plymouth Rocks, 36; Wyandottes, 113; Langshans, 40; Old English Game, 25; Indian Game, 39; Minorcas, 44; Leghorns, 100; ducks, 58; turkeys, 23.

It must always be remembered that in laying breeds we require the production of the greatest number of good-sized eggs at the least cost. In table-bird breeding we must have approved quality firstly, and then birds which are in condition for sale at good prices at the earliest possible dates. People are now finding out that a hen, which eats largely and seems under solemn bond not to lay, is unprofitable. The more energetic are finding out that there is method, and that certain birds, under proper conditions, can be relied upon to give definite and profitable returns. Again, as regards table-poultry of all sorts, experience at once tells us that every week a young bird consumes a certain amount of food; what is required is to gain a proportionate return of flesh at an early date, because the sooner a bird is fit for consumption the less the cost of feed and the quicker the turnover, hence a greater profit. Birds which spend months in building up a large frame which may or may not eventually carry a lot of meat of varying quality will not be found profitable. A medium-sized chicken, say 4lbs. or 5lbs. weight in good condition, is the payable bird for all markets. I very much question whether, if poultry were sold by weight, it would pay to keep birds several months in order to attain great weights, such as 8lbs., 9lbs., or 10lbs. at as many months old.

We hear a good many complaints about hard times; we are asked what employment can be found for the aged, infirm, or for women. There is unlimited scope for all these in poultry keeping; let such keep in the healthy country and not crowd into the city. No occupation is more suited to women; most of them have a natural gift for dealing successfully with poultry, and the work is very light. Look on the other hand at the universal prosperity of the French small landholders; they know the value of poultry, and everyone keeps more or less.

The power of observation is most valuable in poultry keeping. The eye should be on every bird; no drones should be allowed. A small daily waste makes a big yearly total. The presence in a flock of three or four poor layers means a definite shortage of production, and an increase of the average cost per bird.

Use only the best quality of food; it is not economy to purchase inferior sorts. The object in feeding a bird is either the production of eggs or flesh. To gain either result the food, in addition to containing the necessary constituents to sustain life, must on the one hand tend to produce eggs, and on the other an abundance of meat. It is poor policy to either starve or overfeed your stock—you lose either way.

Now is the time to hatch out your main flock of young birds; you can catch the early summer and Christmas trade, and a succession will come in at a later period. Pullets hatched now will lay in the autumn and winter.

EGG PRESERVATION.

By W. L. SUMMERS.

The idea of preserving eggs from the season of plenty and cheap prices till they are scarce and dear is very old, and numerous methods have been adopted. The lime and salt method is one of the oldest and cheapest, and the water-glass method about the latest. With either method fresh eggs can be kept in good condition for nearly twelve months if proper care is exercised. The eggs *must* be fresh, and if infertile so much the better. No cracked eggs should be put in the pickle, as they will soon go bad, making the pickle smell very badly and spoiling the other eggs.

Of the two methods, I have found the water-glass by far the simplest, very satisfactory, and cheap. Last season I put down a few dozen eggs in October in a pickle consisting of one part semi-fluid water-glass in twenty parts (by measure) of water, and used the last of them in May. They kept in splendid condition, and there is no reason why they should not have kept several months longer. The eggs were considered to be in better condition than those kept in the lime pickle. In the annual report of the Ontario Agricultural College, Canada, it is stated that eggs were kept in same strength solution for six months and were then fit for eating. When preserved eggs are boiled the shells should be pierced with a needle; otherwise the shells will burst, owing to the expansion of the air inside.

Two points must be borne in mind when making the water-glass pickle. First, the quantity mentioned refers to the semi-fluid form, as thick as treacle, and not to the liquid form—which I believe is sold in Adelaide—which is considerably weaker. The second is that the pickle is made by adding twenty parts of water to one part of water-glass by measure, and not by weight. Thus, a gallon of water will weigh approximately 10lbs., and a gallon of water-glass in semi-fluid form 14lbs. To make the pickle, boil 2galls. water and when cool add 1½lbs. water-glass, stirring it well. The pickle may be placed in receptacles, and the eggs placed in it as obtained. Water-glass can be obtained from Messrs. A. M. Bickford & Co. at 6d. per pound, or in large quantities at 4½d. per pound. A four-gallon kerosene tin will hold about 16doz. to 18doz. eggs and will take, say 1½galls. of pickle. One gallon of pickle will cost 3½d. by getting large quantities of water-glass, and will cover from 10doz. to 12doz. eggs; so that it will be seen the cost is very small, in fact scarcely worth taking into account when the efficiency of the method is the main point. Probably the water-glass could be used more than once, but being so cheap it is scarcely worth while risking the loss of 10doz. eggs for the sake of 3½d.

There are many different methods of making the lime pickle, but the following is the one we have found very satisfactory:—Slake 3lbs. of fresh lime in 3galls. water, let stand for twenty-four hours, stirring well occasionally, then, when well settled, draw off the clear liquid, taking care not to disturb the lime sediment, and place in tins or jars, adding 12ozs. salt and 1oz. cream of tartar. As previously stated, we have kept eggs in lime pickle for a long period, but there are always some eggs bad, generally going black and smelling badly, necessitating fresh pickle being made and the sound eggs taken out and placed in new pickle. The fact that some eggs go black and the contents hard and discolored while others in the same receptacle keep perfectly well may possibly be due to thin shells, or perhaps to the eggs having been sat on by the hens for a few hours before being gathered.

CO-OPERATIVE AGRICULTURAL EXPERIMENT UNION.

South Australia has in the Agricultural Bureau a truly co-operative institution for the dissemination of agricultural information, which has been greatly admired by numerous inquirers, and which has been to a large extent copied in Tasmania and Western Australia. Many of its members, and particularly its founder (Mr. A. Molineux, F.L.S., editor of this *Journal*), are of the opinion that it is the best institution of its kind in the world, and, though "comparisons are odious," the writer would like to refer to what Canada, or at least the province of Ontario, is doing in the same direction in order to see whether we cannot learn some lessons from that country.

First there is the Ontario Agricultural College and Experimental Farm, with the large roll of 333 students, 110 of whom take up the special dairying course. The total expenditure in connection with this branch is £20,000, of which over £5,500 comes back as revenue. In order to popularise the work of the institution farmers' excursions are arranged during the month of June, and during that period over 30,000 persons visit the college for the purpose of seeing what is being done and learning something concerning their own operations.

Then they have farmers' institutes, the membership of which is unlimited. Membership fees are charged, and the department assists with grants of money. Meetings are held from time to time, in many cases monthly, and papers are contributed for discussion, as in our Agricultural Bureaus of South Australia. For the year ending June 30, 1899, ninety-six institutes furnished annual reports to the head office. The total membership of these was 16,808; meetings held, 677; total attendance, 119,402; papers read, 3,133. One society averaged 600 present at each of six meetings. The largest institute has 510 members, and the smallest forty-three. As in South Australia it is found that the success of the institutions depends very largely upon the management. The revenue of the institutes may be spent in (1) defraying actual expenses of meetings; (2) employing suitable persons to address meetings; (3) assisting in circulating agronomical literature amongst members, or establishing a circulating agricultural library; (4) remunerating secretary and others for services rendered; (5) assisting the Women's Institute in the district. The head office sends delegates—principally members of the staff of various central institutions—to address the annual meetings of various institutes, and various bulletins are supplied to the members. A selection of the papers read at the institute meetings is published in the annual report of the Superintendent of Farmers' Institutes, and others in the provincial weekly and agricultural papers throughout the province. The first of the Ontario Farmers' Institutes was established in 1885, ante-dating the Agricultural Bureau of South Australia by three years.

One of the most interesting agricultural institutions in Ontario is the Agricultural and Experimental Union, which has completed its twenty-first year of existence. The most active members of this union are naturally those who take most interest in the Farmers' Institutes, in fact the two organisations are naturally the complement of each other. The head of this experimental union is the Ontario Agricultural College. The committee draw up a carefully-planned series of experiments touching on the most important interests of the producers, and undertake to supply seeds and manures to anyone who agrees to carry out the experiments, or any of them, under the conditions set out and to record results of same. The actual co-operative experimental work has been carried on since 1886, upwards of 1,000 varieties of the various farm crops—cereals, roots, grasses, &c.—have been tested at the experimental farm, and the best of them are also sent out for the co-operative tests, with the result that many

improved varieties have supplanted inferior sorts for general cultivation. In 1886 there were sixty of these co-operative experimental plots on twelve different farms; in 1898, 12,357 plots on 3,028 different farms. The experimenters are each allowed to make a selection from the series of experiments undertaken and are expected to furnish an accurate report at conclusion of same. The list for 1899 comprised five different tests in fertilisers for maize and mangolds, twelve fodder crops, twelve hay crops, twenty-five grain crops, twelve root crops, and eight miscellaneous dealing with cultural methods. That all the experimenters would furnish reports is hardly to be expected; still in 1899 only 739 satisfactory reports were received, whereas 3,485 experimenters received seeds, &c. Every report which showed any signs of inaccuracy was discarded. These included experiments in which the full quantities of materials were not used, where the plots were not exactly of the right size, where the reports were not sufficiently explicit as to yields, &c. A complete summary of the satisfactory reports is published and is naturally of immense value to the farmers of not only Ontario, but other districts. Many of the experimenters of past years speak highly of the value of the union and refer to the direct monetary benefit they have received from its work. One says, "As a result of my experiments I grow more bushels to the acre and make more money on my farm." Another, "I have learned by my experiments that it may make a difference in yield of 16 bush. per acre by using one variety in preference to another." Another says he has more than doubled the yields of a certain crop by using improved varieties of seed, while one states that the introduction of a special variety of barley through the union has in his district alone given many thousands of dollars extra return to the growers. Some of the advantages of these co-operative experiments are summed up by the managing committee as follow:—

The union furnishes a good method by which farmers can secure pure seed of the best varieties of grain, root, fodder, silage, and hay crops to test on their own soils, and thus find out in a very practical way which special kinds are best suited to their own particular farms.

Summary of results and important conclusions from successfully-conducted co-operative experiments are printed annually in the report of the Experimental Union, which is distributed in large numbers by the Department of Agriculture.

Experimental work encourages careful handling, close observation, accurate calculation, and economical methods.

Experimenters get a start in pure seeds of the best varieties of grain crops which rapidly increase in quantity, thus furnishing seed for sowing on large areas and for selling at good prices.

The co-operative experiments, located on over 3,000 Ontario farms, form object lessons for farmers in their respective neighborhoods.

Farmers are frequently enabled to purchase pure seed of leading varieties of grain from their neighbors who are successful experimenters.

Important features of the experiments are frequently discussed in the field, at the fireside, and in the meetings of the farmers' institutes.

Results of experiments conducted by other farmers and by the experimental stations are read and studied with increased interest.

Properly-conducted experimental work adds pleasure to farm life, and forms a very wholesome influence in keeping the boys on the farm.

The whole system leads to a substantial increase in farm profits and to a steady advance in agricultural education throughout Ontario.

All will agree that the results claimed fully justify the existence of this experimental union. Nothing but good can result from carefully-conducted experiments on scientific principles throughout the whole province. The union is supported by a Government grant of about £300, which is supplemented by donations and members' fees. The question for South Australian producers is, cannot a similar system be adopted here with advantage? During the past twelve years the Agricultural Bureau has distributed for trial many thousands of packets of seeds of all descriptions, but the results cannot be claimed to be satisfactory. It is extremely doubtful whether the

reports on trials of seeds total 5 per cent. of the number of persons who received seeds from the Bureau. In many cases the crops from the seeds distributed were treated as ordinary crops, and the produce consumed or disposed of in the ordinary way, without any thought of saving seed for future operations. No actual records in regard to earliness, yield, &c., were kept in most cases, and in some the seeds were not even sown. In quite a number of cases experimenters reported to the Bureau in highly favorable terms of different varieties of plants, and *asked for further supplies of seeds of the same*. One would naturally expect that the first thing a person who obtains a new and valuable variety of any crop would think about would be the saving of seed for further propagation; but such appears to be far from the thoughts of many recipients of seeds. The principle of introducing new varieties of seeds, fruit trees, scions, &c., for trial is a good one; but have the results so far justified the expense and trouble involved? Would not better results be obtained if, say, one or two members of each Branch devoted a small area to carrying out experiments to determine matters which the Branch considers of importance to the wellbeing of the district? Or the experiments might be carried out under the supervision of the Department of Agriculture. The expense in each case would be comparatively little, and could be met by subscriptions from those interested, which subscription might, under proper regulations, be subsidised by the Government. The crops would, of course, belong to the cultivator, or be purchased at a fair valuation in case of new varieties by those assisting to meet the expense. Immense good would result from carefully-conducted experiments of this description, not only to the districts immediately concerned, but to the colony generally, by the publication of a report embodying the results of the various experiments. If by the introduction of new varieties, or the adoption of different methods of cultivation, the returns were only increased to the extent of 10 per cent. over those usually obtained, the expense of these experiments would be returned a hundredfold to those concerned. Which will be the first Branch of the Agricultural Bureau to take up this matter of co-operative experiments in place of individual tests under varying conditions as in the past?

AUSTRALIAN APPLES.

Mr. J. M. Sinclair, Victorian Superintendent of Exports, at present in London, reports that the s.s. *Ophir* brought 16,800 cases of apples from Tasmania, South Australia, and Victoria, the larger proportion being from Tasmania. The fruit arrived in excellent condition. There were also a few cases of Doradilla grapes, in cork dust, which were also in good order. A considerable proportion of the Tasmanian apples were small and badly graded, and were a striking contrast to the Victorian and South Australian fruit, which was of excellent quality. The badly-graded Tasmanian fruit is that which has been purchased for forward delivery, as a speculation, by London agents, a large proportion of the Tasmanian crop being bought up in this way.

Victorian and South Australian are now recognised by Covent Garden salesmen as of superior quality to Tasmanian, and invariably realise higher prices. Retail salesmen or shopkeepers, however, generally sell all Victorian and South Australian apples as "Tasmanian," that colony having been the first to export, and still continuing to forward the largest quantity. As there is now a marked difference in the quality and grading of the fruit, this is to be regretted. "If there is a possibility of doing so," remarks Mr. Sinclair, "it would be desirable for fruitgrowers in Victoria and South Australia to take combined action in the direction of having their fruit exported to London placarded or advertised as 'Australian.'"

This is a subject well worthy the attention of all growers of fruit for export.

ORCHARD NOTES FOR AUGUST.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

This month ushers in a busy time for the fruitgrower.

In all but very late districts the planting and pruning of deciduous trees will be completed, and the planting of citrus trees undertaken. It is quite useless attempting to grow these trees in soils which are not thoroughly prepared and well drained, either by natural or artificial means. Shelter from strong winds is also absolutely essential to successful citrus culture.

Oranges have thus far succeeded best in sandy or alluvial soils, but lemons of the best quality have been produced chiefly upon clay loams. Unless subterranean drains are resorted to, all citrus trees appear to die prematurely when set over retentive clays, no matter what the surface soil may be. In selecting trees from the nursery, procure small, healthy, deep green looking specimens, and do not seek to obtain value in dimensions. The time to transplant is indicated by the buds in the axils of the leaves beginning to push out, just merely showing a pale green tip. If reasonable care is exercised in lifting them, no check occurs, but if allowed to make young shoots several inches long, the shifting will almost invariably result in the young growth dying off. Should only large trees be available, and these possessing merely a portion of their original roots, it is a good plan to head the trees back pretty severely on planting, or shortly afterwards. An advantage is also gained by shading the stems of headed-in orange or lemon trees from above—a piece of hessian stretched horizontally on four stakes acts admirably. This is preferable to putting casks or sugar mats around the sides. It is not advisable to put large quantities of manure or old bones, &c., in the holes beneath citrus trees. If the soil has been impoverished, a barrow load of well-rotted stable manure may be *mixed* into the soil where each tree is to be set, at the time of planting, but it should not be applied unless thoroughly decomposed. The trees succeed best when planted fairly well out of the soil. Try to gauge the setting so that when the soil has settled into its ordinary position the crown of the roots—where they join the stem—is just visible, though not wholly uncovered.

In the selection of varieties the Navels stand first in quality, though somewhat uncertain in bearing. The Washington Navel has, up to the present, proved an earlier and more productive variety than the Australian Navel, while at the same time the rind is thinner and the “navel” less pronounced. The Paper Rind St. Michael is a first-class fruit, the best probably of ordinary types. Malta or Blood, Parramatta, Siletta, Rio, Sabina, and Oval China, are all good well-known varieties. Among the later introductions Homassassa Sweet, Joppa, Jaffa, Mediterranean Sweet, Compuda, and Valencia Late come with splendid recommendations from the adjoining colonies and California. I have been privileged to sample most of them, and can thoroughly commend them for trial by our planters.

The late Valencia is something quite unique in its ripening. It is ready to gather when all other varieties are harvested.

The Mandarin varieties certainly should receive more attention here. On the Emperor and Scarlet varieties large fine fruits can be obtained locally. The Canton and Thorny sorts are small but solid. Dancy's Tangerine is also of good quality locally. Parker's Beauty of Glen Retreat—the queen of mandarins—is also obtainable here now.

Of the bitter varieties Poor Man and Flat Seville are the best for preserves.

In lemons the Lisbon is as yet the best of the proved kinds, and may be safely adhered to when planting in quantity, though trials with newer kinds such as Eureka and Villa Franca are commendable.

Among the citrons the large round variety known here as Bengal is best.

In addition to good well-drained soils and shelter from winds, water for irrigation must be available, and it is absurd to plant largely before an abundant and cheap supply of water is assured, as it will not pay to use the water from the water mains at the present rates per 1,000 galls.

In some districts the grafting of fruit trees will come into the work for August. Scions which have been selected from trees of known value should alone be used. For stocks up to the thickness of a man's finger the whip or tongue graft is best. For others up to 1 in. in diameter the cleft graft will be found successful. Old limbs or trunks several inches in diameter are least injured if the crown or bark graft is used. If several scions are inserted around the edge of a large stump, the partial decay frequently noticed can be largely averted. The great essential to success consists in adjusting the cambium layers—not bark—so that they are in direct contact in both scion and stock. If a proper affinity exists between the stock and scion (that is, if they are closely related in the same family or botanical order) the sap will flow uninterruptedly from stock to scion, and the fusion of cells will be accomplished. When the scions are fixed the whole of the cut sections should be carefully covered with wax or clay to exclude dry air, &c. An experienced orchardist tells me there is an advantage in working the central limbs of an old or fairly large tree, and removing or working the outer ones a year later. This is all right should the limbs be near the ground, but high top grafting cannot be recommended. Should the tree be stumped back, a covering of straw or bagging bound around limbs or trunk will assist in repelling sunscald much better than a coat of whitewash. (In this *Journal* for September, 1898, an illustrated article on grafting appeared.)

Reports are coming in from many quarters complaining of the early appearance of the black aphid on the peach. It is a good plan to make a careful survey of the peach trees while they are quite dormant, to ascertain if this pest can be found on last season's shoots. They are usually found upon the under sides of these shoots, in the form of an occasional black shiny female surrounded by numerous small bright brown progeny.

The best sprays used here are tobacco and soap wash, kerosine emulsion, and resin compound. Of these the tobacco wash is safest and very effective. The following is a good formula for tobacco wash:—

2ozs. strong or 4ozs. weak refuse tobacco.
4ozs. common soap.
1 gall. water.

The nicotine is dissolved out of the tobacco by boiling, and the soap sliced and dissolved by the same process. After straining, enough water is added to make the gallon of spray wash. The peach trees, or any others affected by this pest, should be absolutely drenched throughout—twigs, branches, and trunks—and the wash poured or encouraged to run down around the bole of the stem on to the crown of the roots. Owing to the rapidity with which these insects breed it is necessary, in the case of a bad attack, to spray the trees at short intervals, say every forty-eight hours, until the pests are extirpated.

These washes kill by contact only, consequently the need for drenching every portion of the tree is obvious. For this reason I favor enclosing the trees in a tent and fumigating them with the smoke of tobacco waste or cyanide, as these fumes will reach every insect, and, if carefully done, absolutely kill all of them.

In orchards infested with codlin moth, should many trees be clothed in rough dead bark, it is advisable to begin scraping away this refuge for the pest while the bark is yet softened by moisture. All knot holes should be scraped out carefully, and old trees with rotten or hollow trunks should either be removed

or cut back and grafted at the ground level, or below the decayed part. As the fruit houses become empty of apples and pears steps should be taken to cleanse all crevices or woodwork, and if at all practicable a strong sulphuring of the empty interior will destroy many noxious germs, both animal and vegetable.

The season for spraying some kinds of fruit trees with Bordeaux mixture has arrived. The peach and nectarine come first. It has been found by experience that the curl-leaf fungus which attacks these trees is most effectively controlled where this fungicide is applied as the buds are on the point of bursting, just when the pink color of the petals in the bloom is visible.

The spraying of apricot trees for the suppression of shothole disease follows closely upon that of the peach, and the swelling buds indicate the time of application. I have seen a large orchard of apricot trees sprayed when almost white with bloom, and still a good crop was harvested. In spraying with a fungicide it must be clearly understood that the minute spores of the disease are lodged in almost every available crevice or budscale on the tree, and it is therefore necessary that the trees should be drenched from the highest and smallest budpoint to the base of the trunk.

There are many formulæ for the manufacture of Bordeaux mixture; some use 6lbs. bluestone, 4lbs. fresh lime to make 45galls. of mixture. I believe this has proved successful. Personally I favor the one in five mixture for winter use, that is when the trees have no foliage. This is composed of 5lbs. bluestone, 5lbs. fresh lime to 25galls. of water. The bluestone may be dissolved by boiling, or being suspended in an open woven sack in a barrel of water for a day or so; it will dissolve out readily by this method. The lime should be slaked with as small a volume of water as possible in a separate vessel. When slaked, enough water to thin it down to milk-like consistency should be added. It should then be strained into the bluestone solution. A piece of bran bag makes a good strainer and is readily obtainable. If more care were taken in straining the lime, less waste of time and annoyance would be encountered. The mixture should be constantly stirred during the spraying. Iron vessels, unless thoroughly coated with red lead or tar, should not be used in any of the operations connected with the compounding or distribution of Bordeaux mixture. The ingredients should not be combined more than an hour or two before the spraying takes place. The limewater should be added to the bluestone solution.

The time to give the second ploughing has now arrived, and a shallow furrow should be all that is needed to bury the weeds and throw the soil back to the tree stems. In early localities it will be necessary to begin cultivating the surface down to a fine tilth at once. In those orchards in which the early ploughing has not been done it is not wise to risk the loss of moisture which would follow deep ploughing at this late period.

NOTES ON VEGETABLE-GROWING FOR AUGUST.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The subjection of weeds is a matter requiring urgent attention at this time of the year in most gardens. Every available moment during sunny weather should be given to this work. It will be found a good plan to scatter a dressing of quickly dissolving manure such as nitrate of soda, sulphate of ammonia, or superphosphate along between the rows prior to hoeing the soil. The same operation then will destroy weeds, aerate the soil, and incorporate the fertiliser into the ground for the early benefit of the vegetables.

On the plains cabbages and cauliflowers may be planted, though the season is rather advanced in exposed dry positions. The transplanting of onions will be completed as soon as possible. If the onion disease, which causes the plants to rot away at the ground line, has been noted during previous years, those beds should not be again planted for some years with any of the onion family. Sowings of onions for pickling purposes could be made now. Any white onion will answer pretty well for this purpose under a method of close sowing.

Potatoes may be planted in most localities where late frosts are not prevalent. Well-started setts should be used. The growth from the eyes should not be sufficiently advanced to break off in handling. If fertilising is necessary a good dressing of finely-ground bonedust strewn along the trench above the setts will give good results. For this crop I prefer planting the setts from 4in. to 6in. deep. Good plump setts with a few eyes, or small whole tubers, have proved better than small setts with a large number of buds or eyes.

Beds of asparagus can yet be made. The ground for this purpose must be well broken for about 2ft. deep, and about $\frac{1}{2}$ cwt. of good well-rotted barnyard manure for each square yard worked into the soil. Rows 2ft. apart and the plants set out about 15in. from each other in the rows will be found suitable. The crowns of these plants should be set about 3in. or 4in. below the surface of the soil, and the roots spread out carefully. A dressing of common salt, $\frac{1}{2}$ lb. to the square yard, or about double that quantity of kainit will be beneficial.

Though getting late for the drier portions of the country, rhubarb may yet be planted if attention is paid to the preparation of the soil and the careful planting of the crowns. The ground for rhubarb should be prepared like that for asparagus, excepting that it requires to be enriched very much more and the saline dressings withheld.

Potatoes, cabbages, and cauliflowers in exposed positions will require careful mounding up to avoid damage from the severe winds usually experienced at this season. A dressing of superphosphate prior to the mounding will prove beneficial.

The ground should be got ready for the main crop of summer vegetables, and where only half-decomposed manure is at hand, the sooner it is worked in the better, as the lessening supply of rainfall will render the decomposition much slower later on. The melon family require much humus, which can be supplied in this manner, and, though they will not be sown in the open for a couple of months, yet, by preparing the soil now, plant food will be available from the manure when the plants require it.

In frames made upon heaps of fresh manure to impart heat, as described in last month's notes, further sowings may be made of tomatoes. In small pots, plunged in such frames, a sowing should be made of cucumbers, melons, pumpkins, &c., so as to have them ready to plant out as soon as the ground and atmosphere warms up. By using pots the plants, if hardened gradually, may be set out without any root-check. All plants raised in this manner must be sparingly watered, particularly in very damp murky weather, otherwise they rot away at the ground line. They also require abundance of light and fresh air, and good room allowed each plant, or the specimens will be drawn and sickly. Most kinds of herbs may be taken up, sub-divided, and transplanted.

Successional sowings of cress, radish, lettuce, etc., for salad purposes, should be made. Sowings in drills of peas, carrots, parsnips, beets of all kinds, parsley, spinach, and turnips can be safely made on the plains country, where water is available for irrigation during summer. Care should be taken to thin out all young crops of the above kinds before the plants become crowded and drawn.

LUCERN SPRINGTAIL, OR SMYNTHURUS.

BY W. L. SUMMERS.

About 1884 a small insect was noticed in large numbers in the lucern fields round Morphettsville, doing great damage to the plants, the leaf surface being almost entirely eaten away, leaving the stems, veins, and leaves practically a grey skeleton and useless for food purposes. How long the insects had been there before their ravages became noticeable there is no means of ascertaining. For several years afterwards growers viewed the presence of the pest with great alarm, and many remedies were tried. The insect, from its jumping habit resembling a particular friend of man and beast, soon became known as the lucern "flea," and by this name it is now generally known in South Australia, though it is a misnomer, and "Springtail" would be the more accurate description.

Specimens of the insect were sent to Messrs. C. French, Victoria, Claude Fuller, of New South Wales (but now of Natal), and to H. Tryon of Queensland, all of whom identified it as a species of *Smynthurus*, probably *S. viridis* or an allied variety.

As far back as 1891 the Agricultural Bureau carried out experiments to destroy the insects on Mr. Jas. Bell's property at Morphettsville, kerosene emulsion, Paris green, and London purple being tried without satisfactory results. Many of the insects were destroyed, but the fields were soon as badly infested as ever. Amongst the many methods partially successful, adopted later on by landowners, the following may be mentioned:—Grazing sheep on the affected land while the soil is moist until the surface is well puddled; harrowing and rolling affected patches; deep working; flooding the land; drawing galvanized iron dressed with some sticky substance and mounted on low wheels over the paddock after the lucern is cut. These remedies are, however, only partial, and in some cases difficult of application. Besides, the trouble is that the "Springtails" swarm in other vegetation on the roadsides.

The only effective remedy on the lucern paddocks so far has been the application of gas-lime fresh from the retorts. This has been largely used around Morphettsville and Glenelg at various times, and the unanimous opinion is that it is the only satisfactory treatment. I am fully aware that many who have not used it contend that it will destroy plant life of all descriptions, but the experience of practical men who have used it year after year is certainly worth more than any mere opinion can be. It is, of course, well known that gas-lime used in too large quantities will injure the lucern, and many softer plants would succumb with the least dressing, and care in its application is necessary. The gas-lime would appear to kill the insects by contact as well as by the fumes given off, and also to remain effective for some time after application, hence the success achieved; in addition, it undoubtedly stimulates the growth of the lucern. Generally the gas-lime, as fresh as possible from the retorts, is applied after cutting the lucern, and two or three dressings are sufficient to keep the insects under. About 7cwts. to 10cwts. per acre is applied at a time. A lighter dressing is found to be of little use. It is quite possible that Paris green at the rate of 1lb. to 200galls. of water sprayed on the plants would keep them free, and would not injure stock if they were kept off for several days; but the expense is against anything like this being done. For the same reasons other solutions and mixtures that will kill by contact or by poisoning are not availed of. Mr. Charles French suggests that a sulphate of iron solution applied by means of the strawsonizer would destroy the insects.

As far as can be ascertained the habits, &c., of the insect in South Australia have never received any scientific study; consequently definite information is wanting. As a result of close general observation during the past eight or nine

years I have observed the following points:—1. The insects appear after the first rains, usually about April, and remain until the advent of hot weather; a good hot dry northerly wind appearing very effectual in getting rid of them. 2. Although the insects are present every year, they are usually very numerous and destructive after an early winter; on the other hand, after a dry autumn they are not so numerous; moisture appears essential to their vigorous growth. 3. On land subjected to flooding for irrigation purposes in summer they do not appear to make much headway. 4. Not only is the young growth of the lucern destroyed, but the crown of the plant also appears to be injured, with the result that after severe attacks the later growth is weak.

In regard to what might be classed as climatic conditions, the present season has been distinctly favorable to the increase of the pest. The rains came early and the soil has been kept moist by continual showers. Already the insects are doing great damage to vegetation; in some instances the young wheat crops being greatly injured. In the past few seasons the dryness of the autumn months resulted, viewing the attack generally, in comparatively light attacks; though in places the insects are so numerous every season as to make it almost impossible to grow tender plants in the open during the winter and early spring months. It is noticeable that the earliest insects are generally to be found in the hollows after a first light rain, sometimes in the early part of March, and it is not unusual to find the water which has collected in the shallow depressions covered with them. If dry weather follows the insects will apparently disappear. This may possibly point to the reason for the comparative freedom of irrigated lands; the moisture would cause the development of the insects at a season when hot winds are usual, and consequently they would be destroyed before they increase to any large extent.

The greatest drawback to any steps taken to destroy the insects is the fact that while they have a special liking for lucern, they will feed on any other soft vegetation. Grass of all kinds, the so-called Cape weed or dandelion, vegetables, ordinary soft garden plants, and even young cereal crops being attacked. If a paddock is cleared of the insects they will soon swarm back from the surrounding country. The insects have during the past few years spread southerly to a considerable extent. They are reported numerous in places south of Morphett Vale and Clarendon, and are probably still further south. They do not appear to go far in a northerly direction, probably owing to climatic conditions.

CULTIVATION OF HORSERADISH IN BOHEMIA.

Horseradish is grown on a considerable scale in various parts of Bohemia. The variety of horseradish known as the "Maliner," or "Maliner Kren," is considered superior to any other. It is distinguished by its unusually sharp, penetrating taste, uniform shape, and excellent keeping qualities.

According to Mr. H. Schmidt, of the Agricultural College in Leitzmeritz, Bohemia, a deep, loose, strong soil, with plenty of moisture, is considered the most suitable for the growth of horseradish. In the autumn the soil is forked over to a depth of 2ft. or 2½ft., and well-rotted farmyard manure is thoroughly worked in to the depth of 1ft. or more. A narrow bed, 3ft. wide, is then prepared, and late in March (August) or early in April (September) the horseradish cuttings are planted along both edges, alternating so that they are not opposite each other across the bed. The cuttings are 12in. long, and are set out 18in. apart. Instead of being placed vertically in the ground, they are planted in an oblique position, with the upper and larger end covered by only ½in. to 1in. of earth, while the lower lies 3in. or 4in. deep. As a consequence of this slanting position, the new roots thrown out from the lower end of the cutting

strike vertically downward, making nearly a right angle with the main stem, and it is from these slender roots that the new cuttings for the next season's planting are made. During the summer the ground is kept free from weeds and the surface of the soil lightly stirred. Towards the end of June (November) the bed is gone over carefully, and each cutting uncovered separately and slightly raised out of the soil with the hand. Care is taken not to injure the perpendicular roots which have formed from its lower end. All small rootlets are rubbed off from the body of the root with a woollen cloth, those that are too large to be removed in this manner being cut close with a sharp knife. A small quantity of powdered charcoal is scattered over the cut surfaces to prevent decay, and the cutting is again covered with earth as before. In order to keep the new roots of a uniform diameter, and to prevent their striking deep into the soil and becoming too slender, the beds are sometimes underlaid with a porous cement pavement, $1\frac{1}{2}$ ft. below the surface of the ground. This pavement checks the growth of the young roots and causes them to thicken.

The roots are allowed to continue their growth until the end of September (February), when the harvest begins. The cuttings which have been two seasons in the ground, first as vertical roots and afterwards in the oblique position, are by this time large enough for market. In digging the horseradish a long-bladed mattock or spade is used. This enables the digger to remove not only the obliquely-planted cutting, which is the marketable product, but also the new roots from its lower end, of which the cuttings for the next year are to be made. The radishes are sent to market in neat bundles of several dozens. The uniformity in length and diameter is remarkable, the average thickness being about $2\frac{1}{2}$ in. at the large end and $1\frac{1}{2}$ in. at the other. Restaurants keep their supplies of horseradish quite fresh for several months by planting the roots in cool cellars in moist sand, and the cuttings held over for the spring planting are kept in the same way.—*Journal of the Board of Agriculture.*

PRESERVATION OF WHEELS.

The *American Agriculturist* says:—"Oiling wagon wheels to preserve the felloes and prevent the tires becoming loose has been practised by many for a long time. It is better as a preventive than a cure for loose tires. Stop the swelling and shrinking of the felloes, the rusting of the underside of the tire next the felloe by a coating of oil. Fill the tenons of the spokes also with the hot oil, and you have at least doubled the life of your wheel. If it is well done a tire will never have to be reset. The tenons of the spokes cannot swell and split the felloes. The mistake made is that people do not begin with their wheels in time. Treat the wheel while it is sound. Have it well dried out, give it time to absorb all the oil it will take. Use the best boiled linseed oil, with about one half pint liquid drier to the gallon. Devote at least one hour to a wheel. The oil should be kept up to nearly the boiling point, and the slower the wheel is revolved the more oil will get under the tire where most is needed. Two revolutions of the wheel in an hour is about right. Revolving slowly heats the wood through. This drives out any moisture, the pores readily drink their fill of hot oil, and by the time the wheel has made its second revolution some of the last coating will remain upon the surface. A portion of this will gradually be absorbed into the wood, and the remainder will dry hard upon the surface. The oil should not boil, but must be quite hot—hot enough to expand the tire so that the oil will get under it freely. A light, finely-painted wheel should be immersed in the oil, say, about $\frac{1}{2}$ in. above the tire, as it is between the tire and felloe that the oil is needed. For coarser jobs, or when the paint is considerably worn, immerse an inch above the depth of the felloe. This will fill the joints around the shoulders of the spokes.

FEEDING CALVES ON SKIM MILK.

In some very successful experiments in feeding calves with skim milk at Kansas Experiment Station, U.S.A., great stress was laid upon having the milk sterilised directly from the separators, feeding the milk at a temperature of 95° to 100° to the calves, and in giving meal of Kaffir corn perfectly dry to the animals. It is maintained that no liquid whatever should be mixed with the meal, nor should meal be mixed with the milk. Kaffir corn was fed because it is the cheapest corn in Kansas, and because it contains enough oil to compensate for the extracted cream. Calves were allowed to run with the cows four or five days after birth; then kept twenty-four hours without feed, then, for seven days each calf got 10lbs. only of whole milk each day—4lbs. in the morning, 2lbs. at mid-day, and 4lbs. at night. The second week each calf got the same quantity in two feeds—5lbs. in the morning and 5lbs. at night. In the third week skim milk was gradually substituted for the whole milk. At the first feed 1lb. skim milk, at the second 1½lb., at the third 2lbs.—½lb. more skim milk at each feed, in place of an equal quantity of whole milk, until none but skim milk was given. A little additional skim milk was also added, until, at the end of a month, each calf would take 12lbs. to 14lbs.; at two months, 18lbs.; and finally 22lbs. to 24lbs. each day for each calf. At ten to fourteen days the calves would begin to nibble hay, and thereafter. Before turning the calves on green pasture, a little green feed was gradually introduced with the hay. Unless this were done the animals would inevitably scour when turned from dry hay on to green pasture. Steers were fed all the Kaffir corn they would eat, and they fattened rapidly. Heifer calves were fed moderately with bran and oats, as it was undesirable that they should develop the fat-making habit. All calves had constant access to clean water.

DO NOT RING YOUR HOGS.

This was a general practice years ago, but it is now fast falling into disuse by the best swineowners, writes Dr. Galen Wilson in *Practical Farmer*. There is little danger of hogs rooting up a new pasture provided they have plenty to eat. They will often root up an old pasture with a tough sod, but this is to get the larvæ of grubworms and other earth insects. Nature gave hogs a snout to root with, and for a good purpose. In rooting out and eating worms, grass roots, and the roots of many kinds of weeds, they swallow earth more or less, which seems to be a stomach and bowel corrective. Confine hogs to a pen with a board floor for a while, and then let them out to the ground, and they will go to rooting at once, whether the ground is sod or not, and in rooting they will eat some of the soil. On such an occasion I have seen hogs proceed, when let out of the pen, to a near-by creek and swallow mouthful after mouthful of soft black mud. They knew it was a desirable medicine for them. Keep hogs in a small pen without a floor, and they will root if possible to penetrate the ground with their snouts. When fattening in a pen which has a board floor, throw them an occasional grass sod and they will eat grass, roots, and earth. All these things go to show that, at times at least, access to fresh earth is necessary to their welfare; therefore, to deprive them of it by ringing or close confinement, is contrary to nature and subversive to their best interests.

To keep hogs from rooting up their pasture, an excellent plan is to plough up some corner, sow on a very little corn, and harrow it in. Then they will change from grazing to rooting, as they may choose, but they will always go to this rooting-place to do that kind of work. Corn can be sown on the spot several times each season, but it should always be harrowed in. The animals will fail

to find some of the kernels of corn at first, but these will germinate and make growth, and the hogs will find the young stalks and trace them down until they get both roots and kernels. Undoubtedly to hogs fresh earth is an excellent vermifuge, and their natural remedy for troublesome worms. I regard ringing hogs as cruelty to animals, not only in the pain the act causes, but in the further pain caused by internal parasites of some kinds, which a certain amount of earth in the diet would have prevented. The thought of once destroying a patch of Canada thistle by the aid of hogs occurs to me. There was such a patch in their pastures, and I made that their rooting ground. In one season they cleaned out the thistles, root and branch.

LIVE STOCK NOTES.

TICKS AND LICE IN SHEEP.—Shearing time is now approaching, and flock-owners are reminded that, under the Stock Regulations, all sheep infested with ticks or lice must be dipped in medicaments that will destroy the parasites. If not already done, provision should be made for the proper dipping of all infested sheep immediately they are shorn. Persons who travel infested sheep, or allow them to stray on public roads or reserves, or leave them on any reserves or roads, are liable to a penalty. In certain districts dipping is carried out with great care, and the owners have benefited in consequence by the sheep being in better health and the wool being sound. In many places the parasites have almost disappeared, and there is no reason why these lice and ticks should not be as thoroughly eradicated as scab has been if care and attention is paid to dipping.

WORMS IN HORSES.—Almost every groom has his own prescription for ridding horses of worms, and one of the simplest and most effective of all remedies for this purpose is a two to three drachm dose of sulphate of iron given each morning, with a small bran mash, on an empty stomach. After three doses have been given it should be followed up with a mild purgative, and after this has taken effect, one to two drachm doses of sulphate of iron may be repeated daily for a week.

WORMS IN SHEEP.

The presence of "nematode worms" in several instances in lambs in the South-East districts, which are perhaps more difficult to deal with than the *Strongylus filaria* and *S. contortus*, makes the following article of interest to sheepowners. It was read at a meeting of the Penola Branch, March, 1898, and is at present of sufficient interest to sheepowners to warrant its reproduction.

Lung and Intestinal Worms in Sheep and Cattle.

The researches of Professor Brown in reference to parasites of the lungs of the sheep, and of Professor McFadyean, Principal of the Royal Veterinary College, London, relative to parasitic gastro-enteritis in lambs and in cattle, have enabled farmers to obtain investigations by the best veterinary talent at much less expense than if they had to employ it themselves. These long and patient investigations have solved the problem of the mysterious, and in recent years more frequent, recurrence of certain acute diseases among flocks and herds about the origin and nature of which stockowners have held widely conflicting opinions. Even when local veterinary surgeons have been consulted, as has been the case in the United Kingdom, respecting exceptional and apparently unaccountable mortality among stock, the experts have been at fault,

and unable to arrive at any definite conclusion. Such precisely were the circumstances attendant on outbreaks of disease among lamb flocks in Lincolnshire, Leicestershire, and other English counties in the autumn of 1894, followed by similar attacks in the autumn of 1895, occasioning in both seasons an alarming number of deaths. Local veterinary surgeons, who had personally investigated the circumstances attending the deaths, and inquired into the system of management of the stock, were in disagreement both as to the origin and exact nature of the disease. This and the extensive losses reported determined the authorities of the Royal Veterinary College to institute an adequate investigation of the subject, and in anticipation of a recurrence of the disease in the autumn of 1896 in October last a circular was addressed to members of the veterinary profession practising in Lincolnshire and Leicestershire, requesting them to co-operate in the investigation by sending dead lambs or their viscera to the college laboratory in the event of their being consulted regarding lamb disease. This request was soon followed by the delivery of the specimens asked for, and during the latter half of October and the first half of November entire carcasses or viscera from about forty fatal cases reached the laboratory. Again, in the early part of 1896 application was made to the college authorities by a member of the Royal Agricultural Society for an investigation into a serious disease which had been for many years prevalent among the cattle on his farm. The first fatal case occurred in the year 1879. From that time onward the farm was never free from the disease, and the number of cases gradually increased until in 1895 fourteen animals died. In January, 1896, two animals in the last stage of the disease were sent to the Royal Veterinary College in order that they might be submitted to *post-mortem* examination. These animals were in a very emaciated condition, and they had profuse diarrhœa; they presented the appearance of animals in the last stage of tuberculosis, but they had no cough, and physical examination gave no evidence of the existence of that disease. The following abbreviation of Professor McFadyean's reports on parasitic gastro-enteritis in lambs, published in the Royal Agricultural Society's Journal, and on the same disease (disorder of the stomach and intestines) in cattle will furnish important information it is necessary that owners of stock should be possessed of.

A knowledge of the symptoms of the malady which occasioned heavy losses in the lamb flocks of the English Midland counties in the autumns of 1894, 1895, and 1896, was gathered from the reports furnished by veterinary surgeons who forwarded animals or viscera for examination, and from personal examination of diseased lambs in three different flocks. The most constant symptom was scouring, and this was seldom or ever absent in animals in which the illness lasted for a few days. The diarrhœa was accompanied by rapid wasting and loss of appetite. Abnormal thirst was frequently noted, and in some cases the lambs displayed an inclination to lick sand or earth. This morbid propensity appeared to have been present much more frequently than it was noticed during life, for the presence of sand and earth in the stomachs was very generally found at the *post mortem*. The temperature was generally above normal, varying from 105° to 103° Fahr. Cough, as a rule, was not a symptom that had attracted the notice of the owner or shepherd. In some cases the course of the illness was very acute, the animals dying within twenty-four hours; but as a rule the lambs were more or less ill for several days or weeks. The mortality varied from 5 to 20 per cent., and in some flocks all the lambs appeared to be more or less affected. On one of the farms visited only ram lambs were attacked, but these had not been pastured with the ewe lambs for some months previously. On all the farms from which specimens had been obtained the disease was confined to the lambs, the ewes and other sheep over a year old escaping.

In regard to the cause of the disease, the laboratory record of over forty

post-mortem examinations shows that in a large proportion of cases two or more species of parasites were found in association, and it became necessary to inquire how far these were severally responsible for the illness and death of the animals in which they were found. Three of them—viz., the *Strongylus rufescens*, the *Strongylus contortus*, and the *Trichocephalus affinis*—certainly cannot have any importance assigned to them in this connection. The first of these was only found in one instance; the second was encountered in the fourth stomach in a few cases; while the third was present in the large bowel in eighteen cases; but in only six of these were the parasites numerous. The *Strongylus filaria* (white hair worm) was present in thirty of the cases, and in eighteen of these the lungs were the seat of lesions that were presumably excited by it, and which must have materially contributed to make the animal ill. Owners and shepherds did not know what the deaths were due to, but they knew from former experience of the disease that the “lung worm” was not the cause. Furthermore, the most constant lesion in the disease which prevailed in the autumn was in the stomach, and the most constant symptom diarrhœa, and for neither of these could parasites present in the air passages be held responsible.

The discovery of the true cause of the disease is to be credited to the Veterinary College authorities, who, in the course of the *post-mortem* researches, ascertained the presence in the fourth stomach, its mucous membrane and contents, of hosts of “small nematode worms.” The term means that the worms belong to the new species fully described and illustrated in the printed report. The worms in question are so small that they may be easily overlooked, and indeed they are almost certain to be overlooked if the person making the *post-mortem* examination relies upon a naked eye inspection of the stomach and its contents. Even when present in thousands in the muddy contents of the stomach it is impossible to detect them with the naked eye, unless a very thin stratum of the liquid is examined, but they may be easily made out when a little of the contents or a scraping from the lining membrane of the stomach is suspended in water and examined in a flat-bottomed glass dish. When taken from the stomach of a recently-deceased animal they display active movement, but when putrefaction of the carcass sets in they soon die and shrivel up. If some time has elapsed since the animal's death the worms are generally most numerous in the stomach contents. In the perfectly fresh stomach they are generally in greatest number on the lining membrane, but even then they may be present in hundreds in the liquid contents. Since it was announced at a meeting of Council of the Royal Agricultural Society in November of last year that the cause of the disease then prevalent among lambs was this hitherto undescribed species of nematode worm in the fourth stomach, it was suggested that this worm is merely an immature form of the *Strongylus contortus*, a very well-known parasite, often noted to be the cause of epizootic gastritis in lambs both in the United Kingdom and abroad. Professor McFadyean at some length in his report exposes the falsity of this idea, but this phase of the subject, though specially attractive for scientists, has little interest for farmers.

In reference to the medicinal treatment of diseased lambs Professor McFadyean says—“It must be reluctantly confessed that while the cause of this form of lamb disease is plain enough, the curative treatment of it yet leaves much to be desired. In each of the last three autumns the afflicted flocks were treated with a variety of drenches, and so far as could be ascertained these were about equally unsuccessful in saving the lives of the lambs that were already ill before treatment was begun. This is no reproach to veterinary surgeons, who have an admitted difficulty in killing internal parasites that are more resistant to poison than the animals that harbor them.” Advantage was

taken of the opportunity presented by the *post-mortem* examinations made at the Veterinary College to test the killing power of some of the agents in common use against worm diseases in calves and lambs. The result of these experiments are calculated to give a shock to the confidence which has been hitherto pretty generally placed in some of the parasitocides mentioned. Turpentine is a sheet anchor in the treatment of diseases caused by the round worms, and there appears to be a considerable body of clinical evidence in its favor; but it has to be observed that in the strength of $2\frac{1}{2}$ per cent. with milk it appeared to have no serious effect on white thread worms (*S. filaria*) that had been immersed in it for twelve hours. Even with double that strength it had no apparent affect after a two hours' exposure. In practice it would be impossible to ensure a two hours' contact between worms in the stomach of a living sheep and a 5 per cent. solution of turpentine, because of the necessity of considerably diluting the turpentine for administration and the rapid absorption that sets in as soon as it comes in contact with the mucous membrane of the stomach. It need hardly be pointed out that if the circumstances are so unfavorable for the ensuring of contact between a sufficiently concentrated solution of turpentine and stomach worms the difficulty is immensely greater in the case of parasites lodged in the bronchial tubes or lung tissues.

Arsenic also appears to be a very weak parasiticide, since a twelve hours' exposure to Fowler's solution diluted with forty times its bulk of water left the white thread worms still active. This represents a strength of 1 gr. in 100zs., and a stronger solution could not in safety be kept in contact with the mucous membrane of the stomach for anything like twelve hours. Besides, it must be mentioned that even undiluted, Fowler's solution (4grs. to 1oz. of liquid) did not kill stomach worms with a two hours' exposure, and 1oz. of Fowler's solution is a poisonous dose for a lamb.

Carbolic acid and chloroform appear to be much more injurious to adult nematode worms than turpentine or arsenic, but less active than lysol (a watery solution of tar oils). In each of the series of experiments a 1 per cent. solution of this substance in water proved fatal to the worms in ten minutes, and since half a pint of such a solution may with safety be given to a lamb of six months old, the experiments hold out strong hopes that lysol may prove valuable in the treatment of parasitic gastritis. It has to be observed, however, that while the experiments discredit the employment of turpentine, arsenic, and carbolic acid in the treatment of animals already ill from hoose or parasitic gastritis, they do not prove that these agents are valueless when repeatedly administered in safe doses to apparently healthy lambs as a preventive. For the cure of animals already ill an agent strong enough to kill the adult sexually mature worm is required, and there can be no doubt that the resistance which such worms offer to solutions that are strong poisons to the host is ascribable to the difficulty with which their chitinous integument is penetrated by the solutions. It is possible, however, that the younger worms when they are first taken into the stomach are more easily killed, owing to their having a thinner integument. Repeated doses of turpentine may thus be capable of preventing an attack of parasitic gastritis, though powerless to cure it.

Consideration is next given in the report to the means of prevention, which is proverbially better than a cure. The cause of the disease is, in the narrowest sense of the word, the presence of the parasites described in the fourth stomach, but with circumstances that favor the introduction of the worms into the alimentary canal. In the first place it must be understood that a single nematode worm, or even several, would have no appreciable effect on the general health of the lamb, because indefinite multiplication of the species does not go on within the body. A single impregnated female worm may produce thousands

of eggs or embryos, but these do not develop into mature individuals within the body, or serve there as the starting point of a new generation. They are passed out with the excrement, and afterwards, at an unascertained stage of development, they may find their way into the stomach of another lamb. From this it will be obvious that the parasites might be present in a flock for years without causing any deaths, and without setting up any symptoms of illness. Such might be the case if the flock had a wide range of pasture, as that would reduce the chances of the parasites voided by affected animals finding their way in large numbers into the alimentary canal of animals then or at a later period put to graze on the same land. But in proportion as the number of sheep kept on a given area increased the chances of the re-entrance of the parasites with food or water would be multiplied, and a point might thus be reached at which the majority of the flock would come to harbor worms in such numbers as would produce the characteristic disease. It will be gathered from what has been stated that overstocking plays a most important part in causing the disease. Fields on which a large number of lambs affected with the disease have been grazed are certain to be highly contaminated, and lambs put to graze on such fields the following season run great risk of infection. A striking illustration of this danger was afforded by a case in which only the ram lambs on a particular farm suffered. On inquiry it was found that the disease had been prevalent in the preceding autumn, and that the ram lambs had been grazed apart from the ewe lambs on a field in which the diseased lambs had been kept during the first outbreak.

It has already been stated that the power of multiplication within the body is limited, as the eggs or young worms produced there are voided with the excrement. It is equally important to know that no reproduction at all takes place external to the body. The eggs, or liberated embryo, become dispersed in the soil, or find their way into water; and, although they no doubt undergo a certain stage of development, they do not attain adult size or sexual maturity until they are taken into the stomach. Their powers of existence must be sufficient to enable them to withstand considerable vicissitudes of weather, but it is highly probable that they have a comparatively limited duration of life outside the body. It appears unlikely that these sexually immature parasites can maintain their existence for years in soil or water, and hence even badly-contaminated soil would probably again be safe if sheep were kept off it for two or three years. One can only speculate regarding the efficiency of such agents as lime or salt when applied to the land with the object of killing the worms; but if the parasites are anything like so resistant in their earlier stages of development as they are when full grown, it is difficult to believe that any chemical not absolutely destructive to the herbage could be relied on to kill the worms in the soil.

FARM HINTS FOR AUGUST.

BY THE EDITOR.

There will be a wealth of green stuff in many places this season, and every effort should be made to prevent it going to waste. If cut for stack ensilage, the most convenient spot should be selected now, and fencing got ready for enclosing it. When cutting stuff for stack silage, it should be left on the field to wilt for a time—say one or two days—before being stacked. It should be cut when in full flower, or a little later. Pit ensilage gives more satisfactory results, as there is less waste. Neither pits nor stacks should be erected near to the dwelling-house or the milking-sheds or the dairy, as the odor is anything but agreeable under the best conditions of preservation.

August is about the best time to put in the main crops of beets. Five pounds of seed is enough for an acre. For sugar beet, 2ft. between the rows and 12in. between the plants is enough; but the largest-sized mangolds require 3ft. by 2ft. at least in good soil. If the cultivator is used regularly—as it ought to be—the spaces should be wider. The soil can hardly be too rich for these plants; but ordinary soils will give returns if the soil has been well prepared and the plants are properly “cultivated” during growth. Of course, a fair amount of rainfall is necessary. The seed capsules generally contain more than one seed, therefore it is necessary to single the plants, removing the weakest. The plants will bear transplanting if care is taken not to injure the taproot. Kainit and superphosphate are good manures for beets and mangolds. For shallow soils the Yellow Globe and Tankard varieties of mangolds and the various beets are best. The Red Globe is apt to run to seed. For very rich deep soils, in damp localities, the long red sorts give the heaviest crops. The best crops are raised from seed sown in March or April, but the plants often run to seed at end of autumn. Crops sown now do not usually run to seed so soon.

Where crops have become winter-proud it will be worth while to feed them down with sheep, or to mow them. Where the crops do not progress, despite the rain, it will probably be noticed that the surface soil has caked down. Harrowing will in this case prove beneficial.

Broad beans and field peas are crops that ought to be sown at once, and there ought to be at least one acre or two acres on each farm. The straw is valuable as fodder, and the peas and beans are valuable in fattening pigs and feeding horses. Broad beans should be in rows, 3ft. apart for the tall sorts, and 30in. apart for the dwarf varieties. Each row would be best if containing three rows of beans, sown at 8in. apart, thus— * * * * * as the plants will then support each other. Plenty of well-decayed farmyard manure is good. Heavy clay and marly soils appear to be best for broad beans, but they will do well also on medium soils. Table peas will do in place of field peas, if the dwarf sorts are selected. In any case, it may be worth while to sow some oats or rye, or barley along the rows, to help the peas to grow upward. The rows should be 2ft. apart, three lines in each row, with the plants about 8in. apart. If sown extensively it would hardly be possible to do this, but the nearer these conditions the better. Light calcareous soils of fair depth, and not too rich in nitrogen, will grow good crops. It is rather late to sow peas in the hot dry parts of the colony.

In the South-East crops of onions may be planted. One large grower at least has made this successful, and he had gained experience in the Western District of Victoria, where there are many wealthy onion farmers. The bulbs should be planted in drills 1ft. apart with 4in. between the plants, which should have the bulbs above the surface, or not buried more than a quarter of an inch. Guano and bone meal are good fertilisers for this crop.

Sow sunflowers in rows 30in. by 18in. apart. Two bushels of seed is ample for an acre. Muriate of potash or sulphate of potash will be a valuable manure for this crop. As much as 80bush. of seed have been grown on one acre of sunflowers in Victoria in one season. A bushel of seed weighs 40lbs. This would give over 80galls. of oil if pressed, and 1 ton of oilcake for feeding to farm stock. If 40bush. of seed were gathered it would pay very well to grow an acre of sunflowers for the sake of the fowls, cows, and pigs. The dry leaves are much liked by horses. The seed heads require to be dried on hurdles.

Do not suppose that in the following remarks it is recommended that every acre of fallowed land should be sown. An acre or two, or perhaps a good many acres, ought to be well dressed with farmyard manure, ploughed deeply, scarified and brought down to a good tilth, and got in perfect condition for

sowing at end of September (on the plains, or a little later in the cooler districts) with maize, sorghum, holcus, dhurra, millet, or other similar crops, or with two or more of them. The farmer must sow the seed in drills, and be prepared to frequently cultivate between the rows of plants. The soil must be friable, and not heavy clay. Under this treatment a good crop of summer and autumn green feed is assured. Three pounds of seed of either of these plants ought to be enough to sow an acre in drills 30in. apart.

Potatoes should be planted in suitable localities during this month. On the plains Beauty of Hebrons or White Elephants are mostly in favor. Tubers $\frac{1}{2}$ lb. in weight cut in half lengthwise are best. In field culture plant 36in. x 12in., and in gardens, 24in. x 8in. Put the setts at least 4in. deep, and keep the soil always loose on the surface. Muriate of potash and bone-meal should be scattered along the rows after the setts have been covered with an inch of loam, and then the rest of the soil covered over them.

Carrots for horses are valuable, and can be grown in deep friable alluvium to perfection. Parsnips are excellent for cows, and need a rather stiffer soil. For neither crop should the land be freshly manured, else the roots will "fork," but a fairly rich soil will give best results. Carrots require 12in. x 8in., and parsnips 18in. x 12in. in the rows. As these plants are rather slow in coming up, and weeds will grow apace, it is well to sow a few radish seeds along the rows so that the hoe can be used to destroy weeds between whilst the carrots and parsnips are coming forward. Pull the radishes before they grow large enough to hurt the other roots.

In the South-East barley and oats may still be sown; also field crops of peas.

After the lambs are weaned put the ewes into a poor paddock where they must range about for feed, else they will be troubled with their flow of milk. The lambs should be castrated when a month old, during fine warm weather if possible.

Pen up the pigs that are to be fattened, and be strict in preventing them having any sort of green feed. Meal, crushed barley, peas, beans, and milk are the best for fattening pigs. Ten weeks ought to be sufficient time to fit them for the butcher.

Chicory is much used, and farmers who have suitable land ought to grow it. Sow seeds now in drills 24in. apart, on soil well tilled to a depth of 20in. Thin out to 10in. between the plants, and cultivate frequently. Three pounds of seed is ample for an acre. The seed should have been selected from large, well-shaped roots that have been transplanted for the purpose. After drilling in the seed roll the rows, and directly the plants are up commence to cultivate.

Tares or vetches, lentils, white poppy (maw), lucern, and peanuts can be sown now. Tobacco should be raised under shelter for planting out when danger of night frosts is over.

REWARD FOR THE DISCOVERY OF PHOSPHATES.

Office of the Minister of Education and Agriculture,
Adelaide, January 20, 1900.

Rewards are hereby offered for the discovery and working within the colony of a deposit or deposits of marketable mineral manure, as under:—

1. £500 if found on Crown lands; £250 if found on freehold lands.
2. If found on Crown lands, the discoverer will be entitled to a lease of the land upon which the discovery is made, in terms of Part VI. of the Crown Lands Act of 1888, providing for a lease of 640 acres for twenty-one years.

3. The above rewards will be payable to the discoverer at the Treasury, Adelaide, on the certificate of the Professor of Agriculture that the following conditions have been complied with :—

1. That the deposit is easily accessible, and within a reasonable distance of a railway or seaport, and not within twenty-five miles of any discovery on account of which any bonus has been paid.
2. That the deposit is sufficiently abundant, and is available at a price which will allow of it being remuneratively used for agricultural purposes.
3. That the product is of a good marketable quality, averaging not less than 40 per cent. of phosphate of lime, provided, however, should a phosphate of a lower average composition be discovered, the Professor of Agriculture may recommend that a portion of the reward be granted.
4. The terms of payment will be $\frac{1}{5}$ (one-fifth) on the production of the first 200 tons; the remaining $\frac{4}{5}$ (four-fifths) to be paid, $\frac{1}{5}$ (one-fifth) on production of each additional 200 tons.

Applications, addressed to the Minister of Agriculture, Adelaide, will be received up to and including the 31st day of December, 1902.

E. L. BATCHELOR, Minister of Agriculture.

WEATHER AND CROP REPORTS.

ARTHURTON.—First two weeks of month good soaking rains fell, followed for about a week by fine weather. A few frosts, but crops are growing well and feed is becoming abundant. Stock looking well. Rainfall for year, to end of June, over 7in.

BAKARA.—The weather has been cold; in the early part light showers fell, but later there have been several severe frosts. Stock are looking well, but feed is not yet plentiful. Crops are slow owing to cold weather.

BALAKLAVA.—At the end of June the best rain of the season fell, varying from 2½in to 1in. in different parts. Several sharp frosts have been experienced, but they have not done any harm. Crops are doing well, and some are rather too forward, being nearly out in ear. Feed is growing nicely and stock are improving in condition, and a good spring season is expected. Lambing has, on the whole, been good, and lambs are coming on much better than last season. There are no stock complain's this season. Prospects for season are better than for some years past. A good deal of land is being fallowed.

BOOLEMOO SOUTH.—The weather has been splendid, and wheat and feed are coming on well. Fallowing is difficult owing to the wet state of soil.

BRINKWORTH.—Drilled and manured crops are looking well, but broadcast sown without manure are mostly poor. Feed is good, and stock doing well. Fallowing in full swing. Rainfall for July to 26th, '93in., and for year to date 8·6½in.

CARRINGTON.—Had splendid rains at latter part of June and beginning of July, over 3in. having fallen. A few frosts, however, have since checked the growth of the crops. Many early-sown crops have run up very high and slender. Stock improving and plenty of feed is expected. Lambing season finished up well considering the scarcity of feed during the season. Pigs are doing well, and porkers are fetching a fair price. Fallowing is in full swing, and very many acres are expected to be turned over this season.

CRYSTAL BROOK.—At the early part of month the weather was very showery. This was followed by three very severe frosts; but since nice rains have fallen. Stock in good condition, and lambing has been good. Rainfall for month ending July 26, 2·36in.

DAWSON.—Good rains fell at end of June and beginning of July which gave the crops a nice start. Several frosts have been experienced since the rains and the crops have again been checked in their growth. Fallowing and rabbit destruction are general. More rain is needed.

FINNISS.—In early part of month severe frosts fell, but of late the weather has been showery. Early crops and grass look well.

GAWLER RIVER.—The weather has been rather frosty, which checked the growth of the crops and feed and cut nearly all potato crops. The crops are looking well generally, but in some fields yellow patches have appeared like takeall, but the real cause cannot be discovered. Fallowing is general, and is pushed on as fast as possible. Lambing has given a high percentage. Garden work is fastly progressing. Rainfall for the six months, 10·34in.

GLADSTONE.—The season continues favorable. Crops and feed growing very well, but some crops are considered to be too forward for this time of the year.

KAPUNDA.—Crops are looking healthy, but not growing very fast, the weather being too cold at present. Rainfall for half-year, 12·97in., nearly 3½in. more than last year to same date.

LIPSON.—The season is all that could be desired, and crops are making rapid growth.

LUCINDALE.—This month has been exceptionally fine for midwinter; it was showery only on five days. There were several severe frosts. The floodwaters which appeared on the flats in June have now nearly disappeared. Lamb-marking will soon be general, and the lambs are strong and well grown. Foxes are very numerous, and there are many complaints of their depredations amongst lambs, poultry, &c.

MAITLAND.—The weather for the past month has been splendid—plenty of rain, and good growing weather. Most of the crops are looking very well, and so far the season promises most favorably.

MILLCENT.—During the first part of the month the weather was all that could be desired for the country, but last week there were four heavy frosts, which will retard growth a good deal. Young crops look fairly well, and stock are in good condition and still fetching good prices, but sheep going off a little. Weather showery and cold at present. Good lambing so far.

MINLATON.—Since last report, until a week ago, the weather has been comparatively warm, with a few showers. The last week brought frost and cold winds. Splendid feed now in stubble paddocks. Many farmers following.

MOUNT BRYAN EAST.—Nice showers fell during the first week in July, but very little rain fell since, until the 25th, when some nice showers were recorded. There have been a few sharp frosts, but not so continuous as last year. The rain this month has not reached far to the east of the district, and green feed in that part is scarce. The grass and wheat crops are coming on nicely in this district. Stock are improving in condition.

MOUNT REMARKABLE.—Weather has been very cold, with good rains and heavy frosts. Wheat crop looking strong and healthy. Grass has made good growth for this time of year.

NANTAWARRA.—Nice rains fell at beginning of month, but very little was caught in the dams. Crops are looking well, and feed is plentiful. Stock in good condition, and farmers are busy following. Rainfall for year, to July 20, 8·02in.

ORROROO.—Early in the month splendid rains fell, filling up the dams and tanks. Have had very severe frosts during latter part of month. Fruit trees coming into bloom. Following in full swing.

PINE FOREST.—The weather has been splendid, and have had many nice showers of rain. Crops are growing slowly, but feed is somewhat scarce. Stock generally in fair condition.

PORT BROUGHTON.—Weather last four weeks all that could be desired, and crops and grass look well.

PORT ELLIOT.—Weather most favorable. Wells are low, and there is little running water in the gullies.

PORT GERMEIN.—Splendid weather. Crops are growing very rapidly, and there is an abundance of feed. Stock in good condition.

PORT LINCOLN.—Best season for many years. Lambing season yielded about 80 per cent. Grass is looking well.

RICHMAN'S CREEK.—Over 3in. of rain have fallen since the middle of June, and the crops are making fair growth. Some of the early wheats are running up rather fast, and show signs of coming in ear, but on the whole prospects are good. Stock are in fair condition, but feed is rather short, owing to the severe frosts in the early part of June.

RIVERTON.—The weather has been exceedingly cold, with several frosts, which, however, have done but little damage. Have had but light showers, and crops are looking well.

ROBERTSTOWN.—The season is all that could be desired. Light rains have continued at intervals sufficient to keep the crops growing. A few sharp frosts were experienced in June. Crops drilled in with fertilisers are much more forward than others. Feed is plentiful, and all kinds of stock are in good condition. Rainfall for six months 7·76in.

SADDLEWORTH.—Weather since last report favorable, and the wheat crops—almost invariably drilled in with fertilisers—looking clean and are stooling out splendidly. Occasional frosts, in checking the forward wheat and breaking down the fallow, have been useful. Following is being pushed forward. Prospects of a good grass season are excellent, and lambs should do well. Rainfall this year to July 21st, 10·98in.

SCALES BAY.—The weather has been very cold and several frosts have been experienced. Wheat and grass are growing well, and the lambing season has turned out good. Rabbits are becoming numerous.

SWAN REACH.—Good rains have fallen, and there have been a few frosts, doing but little damage. Crops are looking well, and rabbits are plentiful.

WATERVALE.—The weather lately has been very frosty and cold, and the growth of crops and feed has been retarded.

YANKALILLA.—The weather during the month has been all that could be desired. Rains have fallen very often, and feed continues plentiful. There have been several heavy frosts; the weather has been very cold.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report:—

August 1, 1900.

A splendid month for vegetation brought along growing feed, so that an abundant spring time is at least assured. The wonderful recuperative properties of the wheat plant have again been displayed by the surprising recovery shown in many places where it had entirely disappeared as the result of severe frosts. Now fields everywhere are looking splendid, the young plant having good healthy color and making farmers hopeful, though it is too long away from harvest yet to attempt any reckonings in this proverbially uncertain climate, with our most critical time of the year ahead. Even now more rain is needed to give that subsoil reserve necessary for plant life during the months of excessive evaporation. Some landowners in the wet South-Eastern districts are anxiously looking for rains to fill up their swamps, without which they do not care to face the summer, therefore it is to be hoped that we will have a fairly moist August.

Business has only been of ordinary character, slight dullness in country trade setting in as a result of the reaction in wheat values. Steady progress is being attained in the production of metals; increasing quantities of copper are being raised in new and reopened mines, whilst a favorable report of the Tarcoola field from the Government Geologist draws attention to the possibilities of further discoveries (especially of alluvial deposits under what appears to be geologically favorable conditions) and gives encouragement towards the prospecting of an extensive country that has up to now hardly been explored.

The excitement in the breadstuffs market which set in during June did not live long, the reaction we noted when last writing bringing values back until the advance secured was nearly all lost again, leaving prospects of a rise not at all encouraging, if judged by the good wheat yields that are being reaped in the Northern Hemisphere. The cause of the recent "boom" in values six weeks ago we were told by cables was owing to serious failures in American spring wheat crops, but recent advices flatly contradict this, and in fact reports are now received that good heavy crops are being reaped in that continent. Our trouble in Australia to secure freights to carry away the stock of cereals is only what is also the general difficulty in other countries. No doubt this has been brought about by the unexpectedly heavy demand for steamers required to act as transports and to carry supplies to South Africa, and is likely to continue till the present China difficulty is settled. To our farmers the raising of freights on carriage of wheat is a most vital question when we just look at the advance of 10s. per ton. Compared with last year it means more than 3d. a bushel less for the producer; so that, even if the world's markets were to improve further, the advancing tendency in freights must counteract to a considerable extent any advantage in price. A couple of vessels only are loading breadstuffs at South Australian ports, and trade in flour is extremely dull. Contracts made early in the season by bakers and some speculative purchases made during the recent spurt have put many in the trade out of the buying market for the time being. Good demand for millers' offal for a couple of weeks caused prices to advance, but easing back in these also is now shown. Dullness has characterised fodder lines, and, with grass and herbage plentiful, we cannot expect any liveliness unless the outside influences we indicated create an export demand.

The upward movement in potatoes noted in last led to about a 20 per cent. advance, but the position at moment is not too strong. The marked shortage that we were told existed in New Zealand, it now appears, was really more the outcome of the quarantine trouble with vessels (and which now is nearly removed) than any serious shortage in yield. Intercolonially, holders are more inclined to quit, and it is known that stocks are not low for time of year. In this colony, however, the effects of the severe frosts during April and May, by cutting off a large portion of the new earlies, must be provided for later. The demand for quality, and also for seed purposes, is bringing Tasmanians into greater prominence on this market, so that increasing trade in these is being put through, although there are still considerable quantities held in the Mount Gambier district. Dry crisp samples of onions are worth more money, but stocks are limited, whilst there are still heavy holdings of moist and otherwise indifferent samples, which causes this line to drag very much and show a wide range in values.

A very satisfactory month can be reported under "Dairy Produce" heading. Increasing supplies of butter came forward, but the demand being stimulated considerably by the steady easing in price, increasing consumption kept stocks from accumulating, so that until now there has been no available surplus for export, excepting what has been sent to the Barrier silver fields and in other over-border directions. Again we can report heavy business has been put through in eggs, and although the seasonable drop in value is now occurring, the average for the year well maintained. West Australia during the month figured as usual as our most extensive purchaser. With the advent of Federation, giving freedom of trade and improved facilities (particularly to West Australia), the raising of poultry and eggs must continue to be a paying industry, more especially to the smaller class of producers in this colony; and there are not many directions in which attention and a small outlay of capital can give better

remuneration. Most of the factories that have cheese plants are taking advantage of the high price of this product, and consequently a considerable quantity of milk is thus diverted, and so lessening the output of factory butter. There is quite a dearth of matured samples of cheese, and therefore high prices are being realised, whilst most consumers are compelled to accept very newly-made stuff. In the live stock market a steady fall in value of pigs week by week was shown, so that, although a heavy demand existed for bacon and hams, lowering quotations had to be accepted. A check in the downward trend, however, has now set in and a good season's trade seems assured. Honey has been selling more readily, though quotations are unchanged. Beeswax scarce. Almonds having good sale.

MARKET QUOTATIONS OF THE DAY.

Wheat.—New, at Port Adelaide, 2s. 10d. per bushel of 60lbs.
 Flour.—City brands, £6 5s. to £6 10s.; country, £6 2s. 6d. to £6 7s. 6d. per ton of 2,000lbs.
 Bran.—9½d.; pollard, 11d. to 11½d. per bushel of 20lbs.
 Oats.—Local Algerian, 2s. 4d. to 2s. 6d.; prime Gambier milling, 3s.; ordinary stout feeding, 2s. 7d. to 2s. 9d. per bushel of 40lbs.
 Barley.—Malting, 3s. to 3s. 6d.; Cape, 2s. per bushel of 60lbs.
 Chaff.—£3 2s. 6d. to £3 5s., per ton of 2,240lbs, dumped, f.o.b. Port Adelaide.
 Potatoes.—Gambiers, £2 18s. to £3; Tasmanian, prime redskins, £4 8s. to £4 10s. per 2,240lbs.
 Onions.—Gambier, £2 17s. 6d. to £3 per 2,240lbs.
 Butter.—Creamery and factory prints, 9½d. to 11d.; dairy and collectors', 7½d. to 8½d. per pound.
 Cheese.—S.A. factory, choice, 7½d. to 8½d.; ordinary matured to good new 6½d. to 7d. per pound.
 Bacon.—Factory-cured sides, 6½d. to 7d.; nice farm lots, 5½d. to 6½d. per pound.
 Hams.—S.A. factory, 7d. to 8d. per pound.
 Eggs.—Loose, 1s. 0½d; in casks, f.o.b., 1s. 2d. per dozen.
 Lard.—In bladders, 5½d.; tins, 4½d. per pound.
 Honey.—2½d. for best extracted, in 60lb. tins; beeswax, 1s. 2d. per pound.
 Almonds.—Soft shells, 4d. to 4½d.; kernels, 9½d. per pound.
 Gum.—Best clear wattle, 2d. per pound.
 Dressed poultry.—Turkeys, 6d. to 7d. per pound for good to prime birds; fowls, 4½d. to 5d. per pound.
 Carcass meat.—Handy-sized shop porkers 4½d. to 4¾d.; medium porkers and good baconers, 3¾d. to 4½d.; heavy and rough, from 3d. downward. Veal, 2d. to 4d. per pound.
 Live poultry.—Well-conditioned roosters, fit for table, 1s. 7d. to 1s. 10d. each; medium cockerels and fair hens, 1s. 1d. to 1s. 4d.; light and old birds, 10d. to 1s.; fair quality ducks, 1s. 9d. to 2s.; geese, 3s. 3d. to 4s.; pigeons, 6½d. to 7½d.; turkeys, 4d. to 6d. per pound live weight.
 Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

AUSTRALASIAN BUTTER EXPORTS.—Very interesting figures dealing with the export of butter from these colonies were given at a meeting in Melbourne by Mr. A. M'Naughten, Secretary to the Victorian Dairymen's Association, which prove very conclusively that the Victorian producers, assisted by excellent railway facilities and the State export scheme, are making prodigious strides:—From April 1, 1899, to March 31, 1900, the Victorian export of butter amounted to 16,916 tons, of the average value of £97 per ton, or a total value of £1,640,852. The cheese exports during the same period were of the value of £23,100, and the total value of the Victorian dairy exports for the season was consequently £1,663,953. During the same period New South Wales exported 4,000 tons of butter, New Zealand 6,500 tons, and South Australia 850 tons, making the total Australian exports for the twelve months ended March 31, 1900, no less than 30,500 tons. The British imports of butter last year amounted to 170,000 tons, so that Australia, with its 30,500 tons, has furnished only one-fifth of the British requirements. During the year the British imports of butter from Denmark were 71,000 tons; from Sweden, 12,000 tons; from Holland, 14,000 tons; from France, 27,000 tons; from Canada, 12,000 tons; from the United States, 8,000 tons; and from other countries, 12,000 tons.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, JULY 16, 1900.

Present—Mr. F. E. H. W. Krichauff (Chairman), Sir Samuel Davenport, Professor Lowrie, Messrs. Samuel Goode, W. C. Grasby, Thos. Hardy, M. Holtze, H. Kelly, T. B. Robson, and A. Molineux (Secretary).

Conference re Standard Samples of Wheat.

The Chamber of Commerce intimated that they had nominated Messrs. C. Giles, M.P., J. Darling, jun., M.P., and A. P. Hall, to represent the Chamber, and Messrs. A. E. Davey, J. Black, and J. Hague to represent country millers and wheatbuyers.

The conference had been called for Friday, August 3.

Congress.

The SECRETARY reported that the 12th Annual Congress of the Bureau would be held in Adelaide, on September 11, 12, and 13. Arrangements in connection with hiring hall for meetings, &c., were left to a committee.

Fertilisers Act.

The CHAIRMAN reported that committee appointed to deal with suggested amendments to the Fertilisers Acts, had met the Inspector of Fertilisers and considered the various clauses, and had sent on their report to the Hon. Minister.

Mr. GOODE called attention to a very interesting report in the *Journal of Agriculture* by their assistant secretary (Mr. W. L. Summers) on the use of fertilisers in South Australia. Mr. Summers had gone to great pains in obtaining this information, and he considered the thanks of the Bureau were due to him for the very able way in which he carried out his duties as Inspector of Fertilisers, and moved accordingly. Mr. Goode's remarks were strongly endorsed by other members.

Winter Irrigation.

Mr. HARDY reported that the committee had interviewed the Hon. Minister re proposed experiments in winter irrigation, and he believed satisfactory arrangements would be made for carrying out the experiments.

Purchase of Dairy Bulls.

The SECRETARY reported that the Hon. Minister had signified his approval of the portion of resolution passed at May meeting of the Bureau, recommending the advisableness of the department subsidising, under proper regulations, amounts raised by branches of the Bureau for the purchase of pure-bred bulls of approved dairying strains. The Minister had decided that it was not advisable to offer to sell the bulls at present owned by the department until it was seen to what extent the branches would avail themselves of the offer of a subsidy on amounts raised by themselves.

Field Trial of Implements at Bute.

The Hon. Secretary Bute Branch invited members of Central Bureau to attend the annual field trial of agricultural implements, to be held under the auspices of the Northern Yorke's Peninsula Bureau Field Trial Society, at Bute, on August 8. Mr. Grasby promised to attend.

Journal of Agriculture.

The CHAIRMAN called attention to several matters referred to in *Journal of Agriculture* for July. One in particular seemed strange, and that was at one Branch it was recommended not to work the land after harvest.

Professor LOWRIE said if the recommendation applied to fallow it was a very good one as regards much of their land. He was often afraid to work the fallow to get rid of the stinkwort in February, as it kept too loose. If done just after rain no harm resulted, but they must get a firm seed-bed for the wheat. Then, if it referred to stubble land, there was good feed for sheep for several months, and it would be a mistake to destroy it by working the land.

Standard "Bag" of Chaff.

Woodside Branch called attention to resolution passed at 11th Annual Congress urging the adoption of a legal standard weight for bag of chaff, and asking the Central Bureau to again direct attention to the matter.

The SECRETARY said the matter was referred to the Minister of Agriculture, but, as far as he knew, nothing had been done. It was decided to ask the Minister if it was intended to take any action in the matter.

Extracts and Translations.

The CHAIRMAN tabled the following extracts and translations from Foreign Agronomical Papers:—

Essentials to the Life of Plants.—Of late many papers have been prepared dealing with the very important subject of manuring; but it is also necessary to know something of the chemical affinity of the physical state of the soil, and in what state we find the plant food therein. Many apparently incongruous circumstances can thus be more easily explained. A soil shows, for instance, on analysis a large quantity of nitrogen or phosphoric acid, and yet your crop is very poor, unless you add still more of these constituents. A few fundamental notions may make matters clearer.

Chemical affinity is a force which causes two or more substances to unite and to form another compound substance altogether different in nature and properties. A higher temperature can dissolve the chemical affinity or the compound; so the oxide of mercury into mercury and oxygen. We may find plant food in the form of gas, as a liquid, or a solid. The last may be altered or melted by heat, as wood into charcoal, or if burnt with more access of the oxygen of the air, into gases and ashes. The "liquid" water can be divided into the two well known gases, oxygen and hydrogen—100 parts of water contain in weight 88.91 of oxygen and 11.09 of hydrogen. Our atmosphere consists principally of gases, viz., oxygen, nitrogen, and small quantities of carbonic acid gas and ammonia. This latter is much lighter than air, and so very soluble in water that one quart of water will take up as much as 700 quarts of ammonia. The rain contains more or less of nitrogenous plant food, and therefore is a medium rainfall—not coming down like a torrent—of such importance in adding this to the soil, quite irrespective of the action of the water in the soil. It is interesting to see how the vegetable kingdom is dependent on the animal, and especially the mineral kingdom. The leaves receive from the air in the form of gases, as for instance, carbonic acid gas, breathed from the lungs of animals. Plants grow and obtain all their ash constituents by using mineral matter which is dissolved in the soil by water, or the juices discharged from the surface of, or the ends of the little rootlets. Plants require—besides the gases in the air and a soil from which they obtain their ash constituents or the incombustible part and also substance for rooting in (parasites excepted)—moisture, warmth, and sunlight, or at least light (some fungi alone excepted). While water from the clouds contains fertilising ingredients so beneficial to plants, that from springs holds frequently noxious substances in solution, and soakage water cannot hold many fertilising ingredients suspended in it. After having passed through soil it has lost most of them. The transpiration of watery vapor from the leaves assists in causing an upward movement of the sap into all parts of the plant. This contains the plant food taken up by the rootlets, which force their way through the soil. The action is pretty much as water rises in a pump.

What we call soil is the surface of the ground which we cultivate, and, except in gardens, is not very often more than 1 ft. deep. The subsoil is underneath it, generally differing from it in color and compactness and containing less organic matter. Both have been produced through the action of air and water upon the rocks by disintegration (elsewhere also by frost), especially by means of the acids derived from decaying matter dissolved by water. Neither

sand nor clay are themselves plant food; the fertility of the soil depends on the quantity of decayed vegetable and animal matter; or humus, together with certain salts, as potash, magnesia, iron, &c., which may be in insufficient quantities in it. The chief constituent of humus is carbon, and supplies the nitrogen in the soil, has great power to absorb and retain moisture, and thus dissolves mineral matters, making them fit for plant food. Oats will grow on land containing only 2 per cent. of humus, barley on 3 per cent., and wheat on 4 per cent. While the chief constituents of any soil are sand and clay, of which they are more than 90 per cent. of the dry substance, the amount of humus, or organic matter, varies from 2 per cent. to 7 per cent. and up to 10 per cent.; in fact, peaty soils contain frequently much more, and may become sour, for which lime is the remedy. The nitrogen in the soil is chiefly derived from the humus, although some pounds are brought down in rain and dew, even in South Australia. The humus as such must be decomposed by the action of the air or some other agent before crops can make use of the nitrogen in it, and thorough tillage is therefore of much importance. A vegetable ferment, the bacteria, causes the oxygen of the air to unite with the nitrogen of humus and ammonia, so as to form nitrates in the soil, in which form the nitrogen is available for plant food. Still it is said that good soil contains only $\frac{1}{4}$ th to $\frac{1}{3}$ th per cent. of nitrogen, and perhaps only $\frac{1}{10}$ th per cent. in a clay subsoil. The subsoil should therefore not be turned up too deep. You may gradually go a little deeper with the plough. Most of the clay soils are naturally rich in potash, and possess in a high degree the power of absorbing moisture and ammonia from the air, while they are not porous enough to allow the water and any fertilisers to percolate deeply. Clay soils are therefore generally rich in plant food, cooler than sandy soils, but given to crack in summer. Sand is in nearly all respects the contrary to clay, and a sandy loam is in most localities preferable to any other soil, although it will require more manure. The texture of the soil is at all events worthy of close observation, and it may require skill, labor, and money to correct mechanical defects in the soil. Water-logged soils of course must be drained, and closely-packed clay must be improved by green manuring, sand, and lime. Coarse sand may be so porous as even to be beyond improvement with clay; but finer medium-sized may by such means become fit for many crops. Mr. Warington estimates that an acre of clay loam, to a depth of 9 in., when perfectly dry, with from 60 per cent. to 80 per cent. of clay, contains from 4,286 lbs. to 5,000 lbs. of nitrogen, from 12,000 lbs. to 14,000 lbs. of phosphoric acid, and from 15,000 lbs. to 17,500 lbs. of potash. But what is to be considered is that only about 1 per cent. of this plant food, in the most fertile soil, is at any time in such a condition that plants can avail themselves of it. Most of it has before to undergo chemical changes, and thus a crop may find no nourishment in a soil in which there is ever so much dormant plant food, and in which the analyst tells you that you have a great store of all the three chief plant foods, but which you find, unfortunately, are dormant instead of active. Unless you add therefore active constituents in the form of fertilisers you must try to change these insoluble plant foods into soluble forms. Fallowing and a frequent stirring of the soil are probably the most effective, as heat, moisture, and air are thus able to come in contact with fresh particles of hitherto insoluble plant food. The mere resting of the soil, and not at all if used for grazing, cannot possibly do this quickly. As before stated, the nitrogen in humus must ferment in the soil by means of bacteria. These do not act well in forming nitrates unless plenty of air can permeate the soil with a somewhat high temperature and moisture, provided neither the heat is too great nor the soil too wet. Lime is frequently of great use in assisting these chemical changes, or potash in either ashes or fertilisers, unless the soil contains enough of this in a soluble state.

Smyrna Figs.

Mr. Robson tabled dried samples of Smyrna figs; he fertilised them with pollen from the Capri figs, with the result that the seeds set and the flavor was good. In reply to question, Mr. Robson stated he had already raised plants from seeds from the artificially fertilised fruit of the Smyrna figs.

Mr. Robson also tabled two varieties of potatoes and samples of fruit of tree tomato (*Cyphomandra betacea*).

Mixing Commercial Fertilisers.

The CHAIRMAN said he had noticed it stated in the local German paper that nitrate of soda and mineral super. could be mixed without injury. He thought this incorrect. He also noticed the Inspector of Fertilisers, in his article on Manuring Potatoes, refers to mixture of these two fertilisers. The Inspector stated that he believed they were often mixed just before using and worked into the land when the potatoes were planted. In some cases the super. was applied at planting and the nitrate of soda used as a top-dressing. Professor

Lowrie said it was quite correct that the chemical reaction resulting from the mixture of these two fertilisers would result in the loss of a certain amount of nitrogen, but if they were mixed dry and applied at once he doubted whether there would be much, if any, actual loss.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Morgan, Messrs. Geo. Schell and Emile Kammerman; Mallala, Messrs. Richard Butler, M.P. and Thomas Nevin; Kadina, Henry Kennett; Finnis, Messrs. Amos Green, H. M. Wallenstein, Albert Steiner, and Jas. Engleton; Caltowie, Mr. E. Wilson; Baroota Whim, Mr. J. W. McDougal; Naracoorte, Mr. John Marcus; Tatiara, Mr. A. D. Handyside, M.P.; Renmark, Mr. H. Forde; Willunga, Mr. Jno. McMurtie and W. J. Kimber; Clare, Mr. S. Bray; Kapunda, Mr. Robert Shannon; Gladstone, Mr. G. M. Growden; Angaston, Mr. J. H. Snell; Albert, Mr. A. Steinke; Balaklava, Messrs. Wm. Tiller and Jas. MacLachlan; Colton, Mr. A. J. Inkster; Mount Remarkable, Messrs. T. J. Spratt, J. McIntosh, and W. Morgan; Redhill, Mr. A. E. Ladyman; Robertstown, Mr. W. Farley; Bowhill, Mr. E. Drogemuller.

Reports of Meetings.

The SECRETARY reported receipt since previous meeting of thirty-six reports of Branch meetings.

REPORTS BY BRANCHES.

Appila-Yarrowie, June 8.

Present—Messrs. J. Wilsdon (chair), P. Lawson, J. C. W. Keller, A. Fox, N. Hannagan, J. O'Connell, J. Daly, W. C. Francis, J. H. Klemm, E. Catford, R. H. Grant, C. G. F. Bauer (Hon. Sec.), and one visitor.

BRANCH SHOW—A committee was appointed to arrange for a show of products and industries in 1901.

"OUR BOYS AND GIRLS."—Mr. P. Lawson read a paper, of which the following is a short abstract:—

First he stated that a reform in respect to the treatment and management of the young people is greatly needed. Too many leave the farm and make for the city or towns. Every one that gives up work as a producer is a distinct loss to the community. This can only be stopped by making farm life more attractive and interesting than it is at present in the majority of cases. Look at the Civil servants, for instance, the schoolmasters. They have seven weeks' holiday each year with full pay, and work only five days a week during the rest of the year, and have special concessions for railway travelling. His wages may be anything between £2 and £8 per week. Railway servants have eight hours a day on duty, and many a time one strong able man may be seen helping two or three others doing nothing. They have fourteen days' holiday each year, with full pay and railway concession. The postmaster has even better times and the same privileges. The tradesman has eight hours a day to work (on Saturdays till 1 o'clock), and gets all public holidays, with wages from 8s. to 12s. per day. Shop assistants work eight hours, with a half-day off each week, wages from £2 to £4 per week, and most of the respectable firms give them a fortnight's leave on full pay once a year. And so it is with every person who gets a living in the town, besides being an easier and a gayer life. ["'Tis distance lends enchantment to the view," Mr. Lawson. There is much more misery and discontent in the city than in the country.—GAS. SEC.] Contrast the position of the town workers with that of the toilers on the farm. The latter commences work at 5 o'clock in the morning and finishes at 9 at night. They have dinner in the paddock, perhaps under the shelter of a six-wire fence if rain is falling, or standing up if the ground is too wet. In summer the hours of toil are still longer—from sunrise until dark. Covered with sweat, dust, and grease from the machinery, he takes his dinner under the shade of the six-wire fence; and so it is from Monday morning until Saturday night, nearly all the year round. His pay, if the year is a bad one, or a failure, as it is in too many cases, is a pair of new boots and a shilling straw hat. His cost

and trousers must do with a patch for another year. When a year of plenty occurs his wage does not exceed £1 per week. With such disproportionate hours of labor and unequal wages it is no wonder that young people leave the country and try for situations in the towns. [There is about 90 per cent. too much rose color in the picture of town life and Civil service, and about the same percentage of black in that of the farmer's occupation. Both have their pleasant and unpleasant aspects; but from long practical experience of both, give me the farmer's life for preference.—GEN. SEC.] To be a successful farmer requires a great deal of knowledge and skill, but he has no control over bad seasons, low prices, and heavy taxation. He is unable to raise the price of wheat, but has to accept whatever is offered. Now with respect to the girls. A farmer wanted to sell his cows because his daughter was dissatisfied with the returns from the stockyard work and the cows, and had left him and secured a position in a large shop to work a sewing machine—eight hours a day, save £1 per week, and go as a lady the rest of the time. Even the holidays are against the farmer, for at these times he is too busy to get away and take advantage of the cheap excursion fares on the railways. He thought the farmers should be allowed the privilege of excursion trains at the slack time of year, with right to break the journey anywhere, so they might visit friends, &c., on the way. To make things better for the boys and girls the producer might give them a share in the business. For instance, give the girls a share in the dairy and poultry business, and the boys something from the larger products, so that they might have a few shillings in their pockets, without having to ask specially for each penny they want to spend. Amusements for them should be encouraged, such as quadrille parties, local entertainments, social gatherings, and anything else that would tend to make their life more pleasant and endurable.

Gladstone, July 7.

Present—Messrs. C. Gallasch (chair), J. Shephard, J. Brayley, E. Coe, J. Rundle, J. H. Sargent, D. Gordon, C. R. Phillis, J. King, W. A. Wornum, C. Goode, J. A. Gallasch, J. Milne (Hon. Sec.), and one visitor.

BULLS.—Resolved that members are not in favor of State subsidy to sums raised by subscription for purchase of pure-bred bulls for improvement of dairy herds, as they consider that it would interfere with private enterprise.

EXHIBITS.—By Mr. Shephard, some fine turnips of excellent quality. By Mr. J. A. Gallasch, good oranges and lemons, grown by himself on trees five years old, with very little trouble. There were 10 doz lemons on one tree. By Mr. C. Gallasch, a three-year-old vine that had been killed by frost last year. Mr. Brayley said he had lost a great many vines from the same cause.

Clare, June 15.

Present—Messrs. W. Kelly (chair), H. Carter, G. Lloyd, H. Miller, J. Treleven, W. Kimber, W. S. Birks, C. J. McCarthy, H. J. Yelland (Hon. Sec.), and one visitor.

BULL.—Members do not consider the dairy interest here sufficiently strong to require the purchase of a pure-bred bull by co-operative effort; but a good draught stallion would be a great acquisition to the district, and it was decided to try and secure the services of such an animal.

SPRAYING FOR PROFIT.—Mr. W. Kimber read the following paper from the *California Fruitgrower* :—

Peach Leaf-Curl.—Peach leaf-curl is a disease which has long been known to the orchardist as well as the botanist. Peach leaves affected with curl can often be detected as soon as the leaf buds have opened to a slight extent. A roughened surface of the young leaf and an excess of coloring are usually the first indications. As the young leaves rapidly assume their normal size this curling and arching of the blades is more prominent. Sometimes there is distortion in a small area only, and again the entire blade may be affected. The curling of the edges of the leaves may be upward or downward, or the upper surface of the leaf may be gradually arched from base to tip. When the leaf is full grown the diseased areas may be reddish-green; but usually the green color is largely lost and a pale discoloration characterizes diseased parts. Not only are leaf and stalk affected, but the terminal part of the shoot becomes much enlarged and also pale in color. The fungus is then thoroughly established in

the tip of the branch, and the significance of this is apparent later on. The leaves soon become greyish or mealy in appearance. This appearance is due to the fact that the fungus is fruiting, producing the spores which are to disseminate the disease. After the grayish color disappears the affected leaves gradually dry up and fall off. In the late stages of this curl disease, as with some other peach diseases, gummy exudations are often noted on those twigs which are enlarged by the fungus; or these may occur even on the large branches where a diseased cluster of leaves has been attached. Defoliation of the entire tree does not necessarily mean the death of the tree, but it does mean the death of many twigs, and lessened vitality. New buds, or rather some of the sleeping or dormant buds open, and the tree attempts to supply itself with new and healthy foliage. It is very seldom that this fresh foliage is badly affected by curl, and it is possible to account for whatever curl is now evident as having come directly from diseased buds or twigs. The new shoot growing out from a diseased terminal bud may grow entirely out of the disease, but the swollen part remains below. Thus, when the season's growth is done and the autumn at hand, these swollen areas may mark the recovery of shoots; but they also indicate where the fungus rests, and they are warnings of danger for another season.

Soon after the curl is most pronounced, the graying appearance is evident on all diseased leaves, and on both surfaces of such leaves. The surface is evidently covered with a dense, close growth, somewhat mould-like in character. The fungus which causes curl is then fruiting, forming the spores which are to disseminate the disease; but this cannot be seen by the eye alone. Examining under the microscope some of the close growth scraped from the surface of diseased areas, numerous short, erect, thread-like growths (fertile hyphae) will be evident. Close examination at the time the fungus is mature shows that these erect hyphae are sac-like in appearance (the asci), and they usually contain eight oval bodies called spores. In the asci the spores may sprout or bud, forming numerous conidia. After these spores or conidia are mature they are soon set free from the sac-like structures, and, being so minute and light, they are ready to be borne about by the wind. When they fall upon vulnerable parts of other trees they are in readiness to grow into the tissue and to produce the disease again. The fruit of the fungus is produced on the surface of the leaf, but the true vegetative state of the fungus is within the tissues of the leaf and of the young shoots. The threads or filaments which make up this vegetative state pass in between the cells of the leaf, and it is the irritation due to the presence of these fungus filaments (the mycelium) which causes the leaf to become distorted in form. Passing into the young shoot, the fungus is in condition to pass the winter *in situ*, provided the twig lives, without having to trust to the fortune of winds and rains, as is the case with the spore. It is unfortunate that the exact fate of the more fortunate spores is not known. Since the second growth of leaves is not badly infested by curl, the spores do not produce the disease again immediately, it seems. One of two possibilities is then open, either (1) to germinate immediately and infect the buds which will open the next season, or (2) to be hidden away about the twigs, in the bud scales, or even on the ground about the tree, and there to pass the winter, germinating the next spring. On leaf surfaces of its host plant, Sadebeck has germinated the spores of a closely related species growing on *Alnus*. This took place apparently soon after the spores were produced. It is hoped that some studies now under way will throw light upon this important matter—important because treatment can be made more effective the more complete is our knowledge concerning time and method of infection. At present the results from preventive treatment indicate that normal infections take place in the spring.

Attempts have been made to specially define the conditions to encourage curl. Some have asserted that a cool, moist spring is most conducive to its abundance. The time of infection, however, should be determined, it seems, before any satisfactory explanation may be given. It is quite reasonable to suppose that the conditions prevailing at the time the spores germinate to infect the buds or leaves, would be the factors to determine the greater abundance or the less abundance of the disease the following year. If the spores of the fungus live over the winter on the ground or twigs, and germinate with the first warm days of spring to infect the opening buds, then the spring conditions would seem to be of great importance in determining the amount of the disease. If, however, infections result during the summer or autumn the effect of spring conditions is not apparent. It is well known that different varieties of the peach show different degrees of susceptibility to the attacks of leaf-curl. The same is often found to be true of other plants attacked by other fungus diseases, and it can only be explained by constitutional differences in the varieties.

Remedies.

The early experiments made to determine the value of fungicides for the prevention of peach-curl were unsatisfactory, both because the fungicides themselves often injured the leaves, and also because the best time for spraying was not apparent from our knowledge of the fungus. With our present knowledge of peach leaf-curl the following may be suggested:

1. Spray thoroughly with strong Bordeaux mixture just previous to the swelling of the buds.
2. Spray again with weaker Bordeaux as soon as the petals of the flower have fallen, or after the work of the bees is over.

3. Spray again with weak Bordeaux when the first leaves are just full grown, or at just about the time the spores of the fungus are developing.

The customary formula for Bordeaux mixture for peach trees is—Copper sulphate, 6lbs. ; unslaked lime, 4lbs. ; water, 60galls.

In spraying the foliage of peach trees the amount of copper sulphate may be reduced to 4lbs. The strength may be experimented with, and the mixture should be made by the one method which has been most successful. To dissolve the copper sulphate suspend it in a coarse sack in a barrel containing 30galls. of water. Slake the lime (using only the best) slowly, and then dilute it to 40galls. Pour the two together in this dilute form, stirring for a few minutes. Stir before using. If large quantities of the mixture are desired, stock solutions may be made.

Wilson, July 7.

Present—Messrs W. H. Neal (chair), H. Need, J. Coombes, T. Barnes, A. Crossman, H. T. Crossman, H. Ward, T. Matthews, and A. Canning (Hon. Sec.).

BULLS.—Resolved that in the opinion of members the proposal to subsidise pound for pound amounts subscribed by Branches for the purchase of pure-bred dairy bulls is more fair than the present plan of loaning bulls to Branches.

FARMERS' RAILWAY EXCURSIONS.—This Branch favors the suggestion that excursion trains should be run, with privilege to break the journey, twice a year, at times when farmers can more generally make it convenient to make use of them

FEEDING POULTRY.—After discussion it was concluded that soft food mixed with pollard is the best for fowls in the morning, and grain for evening feed. Pollard is best for egg production. Between June 1 and September 30 was considered the best time for rearing fowls.

Willunga, July 7.

Present—Messrs T. Pengilly (chair), A. Slade, J. McMurtrie, W. J. Binney, John Binney, J. Valentine, T. Atkinson, J. A. Hughes, and C. Bray (Hon. Sec.).

BULLS.—Members approve of the co-operative principle of Branches purchasing pure-bred dairy bulls for improvement of dairy herds in each district, subscriptions to be supplemented by a subsidy of £1 for each £1 raised.

FERTILISERS AND CROPS.—Crops generally have a better appearance than for many years past. Those that have been drilled in with phosphatic fertilisers are much better than those which have been sown without any manure.

Gradock, July 7.

Present—Messrs R. Ruddock (chair), W. Symons, P. Gillick, R. Solly, W. Haggerty, T. Marsh, J. Paterson, J. H. Iredale, J. H. Lindo (Hon. Sec.), and one visitor.

BULLS.—Members do not approve of the idea suggested that Branches should co-operate to purchase pure-bred dairy bulls for use in the district, but think that Branches which have not yet had loan of a bull should have a two-years' loan of one.

RAILWAY EXCURSIONS.—Members would be pleased to have the privilege of breaking the journey at any station when travelling on excursion fares, but do not desire any alteration of the excursions in September and March, on occasions of the Spring and Autumn Agricultural Shows in Adelaide.

ROCK PHOSPHATES—Members wish to know from what sources mineral phosphates are derived? [The principal sources of phosphatic fertilizers are iron ores, various rocks, and coprolites, supposed to be the excreta and remains of antediluvian animals. A great many of the rock phosphates consist of lime in combination with phosphoric acid and sand, &c.—GEN. SEC.]

Quorn, July 5.

Present—Messrs. R. Thompson (chair), J. R. Rowe, Jas. Cook, C. Potter, W. Toll, H. S. Stacey, and A. F. Noll (Hon. Sec.).

BULLS—Members approve of co-operation in purchasing pure-bred dairy bulls, and of a subsidy of £1 for each £1 raised.

EXCURSIONS FOR FARMERS—Members would be pleased to have two excursion days arranged for farmers during the only times when they can spare time to get away from their farms.

FIELD TRIAL—From information recently gained, this Branch does not think that a field trial of cultivating implements, as suggested by Arden Vale Branch, would be successful.

STRIPPER v. BINDER—In discussing this subject members concluded that it would be advantageous to harvest part of the crops with the binder and thrash with the header, and to save thereby a good supply of fodder against a bad season.

Dowlingville, July 6.

Present—Messrs. J. Phelps (chair) T. Illman, T. Lombladt, R. A. Montgomery, G. Mason, G. Inkster, F. Locke, A. Crowell, J. Burkin, and J. L. Broadbent (Hon. Sec.).

BULLS—Members approve of co-operative ownership of pure-bred dairy bulls, with a subsidy of £1 for each £1 raised by subscription. The Branches should have control over the animals, when they would be properly looked after. Mr. Illman considers two good cows are worth more than six bad ones, and pure blood is wanted. With regard to sheep, each farmer should purchase good rams.

THICK SOWING OF SEED—Members think that thick sowing of wheat is necessary in this district. Last year the mice thinned out the seed on the field very considerably, but the rest did not stool out or yield profitably.

Mannum, July 6.

Present—Messrs. J. G. Preiss (chair), J. W. Walker, R. P. Scott, W. Kowald, R. Heidrich, B. Baseby, E. Schuetze, G. Lenger, J. A. Schulze, Hy. Brown (Hon. Sec.), and two visitors

ARBOR DAY—An invitation to members to attend celebration of Arbor Day at Pellerin Flat on July 16 was accepted.

EXHIBIT—Some very good oranges, grown by Mr. R. Bolt, were tabled.

BULLS—Members favor proposal that Branches should receive a subsidy of £1 for every £1 raised by subscription for the purchase of pure-bred dairy bulls.

POULTRY-REARING—Mr. E. Schuetze read a paper on fowls and ducks. He had confined his operations in the former to the best egg-producers. Amongst these there are always some hens which are better layers than others of the same breed, and even when these are selected to breed from, their

progeny are not always good layers. He did not keep any breeds separate, but went in a good deal for crossing. By this method he secured hardier birds, of fair size and weight. Brown and White Leghorns, Minorcas, and Andalusians are the best for laying. Minorcas are also fair table birds. Plymouth Rocks are large, handsome, and good table birds. It was probable that the Black and the Buff Orpingtons would prove to be the best all-round birds. Pepper trees, with a pole between for roosting on, will do better than a small house. He feeds chiefly raw wheat, and gets all chickens hatched by hens, between September and January, and always gets some winter layers. Nests are placed on the ground; place ashes at bottom, with fine straw on top, and good results always follow. The best table fowls are a cross between Indian Game and Dorking. Pekin ducks are good layers, and they mature rapidly. If well fed they can be marketed when nine weeks old. The cross between the Pekin and Aylesbury produces a splendid table bird. Feed ducks on wheat at night, and let them forage for themselves. They do better on the water than when shut up. People living on the river or lagoons can make ducks pay better than fowls. [Mr. Scheutze then read an extract from a paper recently published.—
GEN. SEC.]

Renmark, June 14.

Present—Messrs. W. H. Waters (chair), R. Kelly, C. Millar, S. R. Cox, F. Cole, and E. Taylor (Hon. Sec.).

BULLS.—Members agreed that it would be an excellent way to bring about an improvement in dairy herds if subscriptions raised by branches of the Agricultural Bureau for purchase of pure dairy bulls were supplemented one-half by the Department of Agriculture.

EXHIBIT.—The Chairman tabled eleven Washington Navel oranges of fine shape, color, and quality, and weighing 9½ lbs., total.

Dawson, July 2.

Present—Messrs. C. W. Dowden (chair), J. Collins, A. J. Hooper, W. Kelly, C. H. Meyers, O. Muller, and A. F. Dempsey (Hon. Sec.).

BULLS.—This Branch expresses approbation of the proposition that sums raised by members of Branches for purchase of pure-bred dairy bulls for use in their districts should be subsidised £1 for £1 by the Department of Agriculture. The Jersey bull "Dick" has been stationed at Mr. A. J. Hooper's farm, hundred of Coglin. Members think much better supervision should be exercised over mongrel sires in all classes of farm live stock.

Mylor, June 9.

Present—Messrs. W. Nicholls (chair), W. H. Hughes, T. J. Munday, F. G. Wilson, E. Wilson, W. J. Narraway, E. J. Oinn, W. G. Clough (Hon. Sec.), W. L. Summers (Inspector Fertilisers), and several visitors.

ANNUAL REPORT.—During the year nine meetings had been held with an average attendance of 93 members and 14 visitors. Fifty-seven samples of produce had been tabled, two practical papers read, and two public lectures arranged. The Mylor No. 1 Cow Club has been of great use to the residents; twelve cows have been obtained for the members at a cost of £72. The Mylor and District Co-operative Society—another result of the Branch work in the matter of co-operation—has so far been very successful. As the result of five

months operations a profit of over £28 has been made, and this has permitted of a bonus of 2s. in the pound on purchases by shareholders, and 1s. in the pound to others who have returned the coupons issued by the society. Mr. E. J. Oinn was elected Chairman and Mr. W. J. Clough re-elected Hon. Secretary of the Branch for ensuing year.

FERTILISERS.—The Inspector of Fertilisers gave an interesting address on Fertilisers, their composition, and purchase according to analysis, and specially urged the necessity for inquiry into quality before purchasing bonedust. A number of questions were answered, and a vote of thanks accorded to Mr. Summers.

Kapunda, July 7.

Present — Messrs. H. T. Morris (chair), J. H. Pascoe, G. Teagle T. Scott, J. O'Dea, G. Harris, W. M. Shannon, J. A. Schultz, J. J. O'Sullivan, C. P. Weckert, W. Flavel (Hon. Sec.), and one visitor.

FODDER PLANT.—Mr. Teagle tabled specimen of useful plant for feed; members thought it new to the district. [A variety of *Lepidium*, native to South Australia, and useful for feed.—GEN. SEC.]

Narridy, June 30.

Present — Messrs. A. McDonald (chair), D. Creedon, Jas. Nicolson, J. Smart, E. Smart, J. Liddle, and J. Darley (Hon. Sec.).

DAIRY BULLS.—Discussion on suggestion from Central Bureau took place, but no decision was arrived at.

BLOAT OR HOVEN.—Mr. Creedon reported loss of cow from this complaint and wished to know treatment. [A remedy very widely recommended is one or two tablespoonfuls of carbonate of soda in a pint and a half of water. Quicklime dissolved in water is also effectual. Liquid ammonia, 1oz.; cold water, 1 quart; essence of ginger, $\frac{1}{2}$ oz. is also recommended. If these remedies fail, then the stomach must be punctured midway between the haunch bone and the last rib. This is best done by means of the instrument known as the trocar, which fits inside a hollow tube called the canula, which is left in the wound until the gas escapes. A brisk cathartic, say 1lb. to 2lbs. Epsom salts, 3ozs. of ground ginger, 1lb. treacle, and 1 quart warm ale should then be given.—GEN. SEC.]

Meadows, July 2.

Present—Messrs. W. Pearson (chair), J. Catt, T. B. Brooks, G. Ellis, G. Usher, G. T. Griggs, G. Rice, T. A. Buttery, W. J. Stone, F. W. Vickery, F. W. Dohnt, D. D. Murphy (Hon. Sec.), and one visitor.

"STATE BANK" AND "PRODUCE DEPÔT."—Mr. Brooks initiated a discussion on above subjects, and members concluded that it is desirable that both institutions could be extended in their scope for usefulness to producers.

BULLS.—Members favor the proposition that Branches should be subsidised pound for pound on subscriptions raised for purchase of pure-bred dairy bulls.

COMMERCIAL FERTILISERS.—Mr. Pearson said it would be advantageous to purchasers if the money value of each unit of the various substances in commercial fertilisers could be fixed; as in such a case, by getting analyses and prices of manures, the purchaser could find out which would be cheapest for his purpose.

Gumeracha, July 9.

Present—Messrs. D. Hanna (chair), W. Cornish, A. Moore, W. Hannaford, W. Jamieson, H. J. Kramer, Dr. Stephens, J. Monfries, A. E. Lee, W. A. Lee, T. W. Martin (Hon. Sec.), and one visitor.

DAIRY BULLS.—Members approved of suggestion that the Department of Agriculture should subsidise amounts raised by Branches for purchase of purebred stock, in preference to purchasing stock outright for loan to Branches.

CONGRESS.—Members wish to bring before Congress question of fares of delegates who are unable to travel by rail.

FODDER CROPS.—Mr. Hanna read the following paper:—

The growing of fodder for stock and cleaning the land are subjects that do not receive sufficient attention by farmers in this and similar localities. Wild oats, sorrel, and stinkwort are gradually taking possession of the land in this district, and if we are to exterminate them we must either be in a position to spell our land or else increase the acreage of fodder crops. Where sorrel or wild oats have firmly established themselves it is impossible to grow a clean or heavy wheat crop, especially when the farmer has the same portion of his farm under crop for a number of years in succession, and still adheres to the system of simply ploughing and sowing his land in April or May. Stinkwort has no apparent effect upon a wheat crop, but considerably reduces the grazing value of land for several years after it has been thrown out of cultivation, and also increases labor at seed time.

In a district such as this, where the rainfall is certain, the dairying industry firmly established, and other conditions favorable, an increased area of fodder crops could be grown, and fed to cows or pigs, or grazed with sheep profitably. To assist in the eradication of wild oats the land should be worked with a scarifier, spring-tooth cultivator, disc, or skim plough, immediately after harvest, so that the oats and other seeds may be covered. With the first good rains they come up, and may be kept down by sheep or cattle till April or May. If it is then necessary to put this land under crop a very early variety of wheat should be sown, and cut before the wild oats are ripe. I grew a wheat (the earliest of all) which, except for the weakness of the straw, was all that could be desired. This, I think, is the great fault of all very early wheats. Should the farmer prefer to cut a self-sown crop from this land instead of sowing it in May it should be cut down for ensilage, the land ploughed immediately afterwards, and sown in drills with maize or sorghum in October, using the cultivator between the drills later on. If the crop were left for hay this could not be done, and it is probable that either the seed would fall on the land, or there would be great difficulty in saving the hay, owing to its sappy nature and unfavorable weather usually experienced at that time of the year.

I have little faith in feeding green fodder to stock in winter; far better results would be obtained if more attention were given to the growth of fodder to be fed to or grazed by stock during the summer months, when the natural grasses are dry. Land that has received previous summer cultivation sufficient to start oats and other weeds can be made fairly clean by ploughing it in September, working it down to a fine tilth, and sowing it the same month with 3lbs. or 4lbs. per acre of Broad-leaf Essex rape, Kangaroo Swede, or other turnips. The seed should be mixed and sown with the manure at the rate of 1cwt. or 2cwt. per acre, according to the quality of the land, and sown in drills 14in. or 16in. apart. This can very easily be done by closing every other drill. Roll the land before drilling, and let the hoes work without any pressure except their own weight; follow with a roller or light harrow. When the crop is 4in. or 6in. high run the horsehoe between the drills to destroy weeds and assist the growth of the plant, which should have had sufficient manure applied to give it a good start. Last September I sowed nine acres of rape and fed it off twice with sheep before February. There was a good crop in April, which was partly fed off by cattle and sheep, then ploughed in and wheat sown on the land in May. The sheep did exceedingly well, and came off it in prime condition. Last season was an exceptionally favorable one for this crop, good rains being frequent up to January, followed by early rains. Kangaroo Swede turnips sown at the same time did well with me, and may be carefully grazed with sheep for three or four months, cattle or pigs will then eat the roots if turned upon the crop. Mustard grows faster and is preferable to either rape or turnips for sowing land immediately after the hay crop has been taken off. For dairy cows maize or sorghum should be sown, but the crops previously mentioned will enrich the soil to a greater extent, especially if they are ploughed in green at seeding time.

Owing to the low price of hay and wheat it is important that farmers should increase the stock-carrying capacity of their farms by utilising a larger area for the growth of fodder crops, especially on small farms where the land suitable for cultivation is limited. If a portion of the farm were sown with sheep fodder each year it should be made sheep-proof; do not turn sheep or cattle on the crop when they are hungry, or when the crop is wet, nor should it be grazed too bare, or the crown of the plant will be injured and will not grow again.

This applies to turnips also. Cattle are fond of it, but cows in milk should not be allowed to eat much, or it will impart a strong flavor to the butter. Lucern is one of the very best fodders that can be grown here; it is beneficial to the land, stock are fond of, it and no other hay is equal to it as a food for dairy cows, but it will not stand constant and close grazing. The best results will be obtained where it can be top-dressed yearly with farm-yard manure, and the crop mown for hay; treated in this way it will produce a large amount of fodder annually for many years. There are other fodder crops that could be grown here, but those I have mentioned are the most reliable, and I feel sure would give the most satisfactory results at the least cost. No intelligent farmer would have fallow in a district like this, and I believe if we adopt the system of cultivating our land immediately after harvest, sorrel and stink-wort will be considerably lessened, and wild oats and other weeds will start growth with the first rains. Land treated in this way and ploughed and sown with a fodder crop in spring is the most effectual method of eradicating wild oats and other undesirable weeds, and at the same time increases the stock-carrying capacity of the land at a time when prices of produce are good and green fodder scarce.

Stockport, July 7.

Present—Messrs. J. F. Godfree (chair), D. G. Stribling, S. Rogers, T. Megaw, G. Burdon, T. Howard, T. Hogan, and J. Murray (Hon. Sec.).

FERTILISERS KILLING WHEAT.—Mr. Megan said he had drilled some wheat with super. during dry weather, immediately after the seed had been pickled, and this came up so badly that he had to re-sow the field. Some seed sown in the same paddock at the same time, with super., after being left to dry after pickling, had come along all right.

Elbow Hill and Boothby Conference, July 10.

Present—Messrs. H. T. Styles (chair), F. B. Brooks, W. Beinke, C. G. Ward, H. Dunn, J. Rehn, C. L. DuBois, E. Wake, W. Crooks, J. Elleway, W. Ward, J. Harvey, W. Spence, Geo. Dunn, G. Wheeler (Hon. Sec.); also Messrs J. Whyte, H. Evans, R. Carn, J. A. Foulds, R. Whyte, J. Bell, R. Chaplin, A. Robb, and G. T. Way, members of Boothby Branch, and several visitors.

CONFERENCE.—This was a conference of members of Elbow Hill and Boothby Branches.

STANDARD BUSHEL.—Mr. C. L. DuBois read a paper upon this much-debated subject. He thought a fixed standard of, say, 66lbs. per bushel for South Australian wheat would be beneficial from every point of view. A cargo of 66lb. grade wheat would find ready sale at highest price, because it would produce more flour with less offal than lower grade grain. The time has arrived when farmers must clean their grain better. The offal can be used for feeding, in place of purchasing bran and pollard. Well-cleaned wheat will thus be available for seed purposes, and will have no rubbish in it. When all farmers clean their wheat well it will be possible to co-operate in selling large parcels of one quality—which is almost impossible at present—and higher prices can be secured. Possibly then there may be grading stations established, where grain can be cleaned further if necessary, and bagged, at less cost than can be done by individuals. He thought the only extent to which they could co-operate would be in grading and selling wheat in bulk, and in purchase of manures, bags, &c. The grading should be done at the port of shipment. Mr. Fould's experience was that it does not pay to grade up wheat. If the sample were extra good it would pay to buy inferior grain to mix with it before selling. He had found that what would pass one year would not pass the next. With the modern winnowers it was much easier than formerly to grade and clean wheat.

BULK HANDLING OF GRAIN.—Mr. F. J. Brooks read the following paper:—

This is a question which is now receiving a great deal of attention in the eastern colonies; and seeing that it is of such importance to the farming industry, it is a matter for surprise that it has not been taken up here. Beyond a passing comment, or a report of what is being done in the other colonies, nothing is heard of it.

The bag question is a very sore one with most farmers, and it is certainly most eminently unsatisfactory. I have for some time inclined to the opinion of the single taxers, viz., that all things come from the land, and all expenses must be paid by the land; and my experience in the farming industry during the past three years certainly serves to strengthen that opinion. Merchants tell us that the present system costs the farmer no more than the old system, the only difference being that under the present system we purchase and pay for the bags in hard cash, so that we know we are paying, and under the old system we paid for them through a reduced value for our wheat, and consequently did not notice it, so that whatever the system the result is the same. This being so, it behoves us to seize and make the most of every opportunity for reducing the cost of handling our grain. Last year we reaped, according to official returns, 8,453,155 bush. of wheat, and to bag this it cost us 6s. 6d. per dozen, which amounts to £57,334 15s. 6d., of which approximately £13,208 0s. 4d. was repaid to farmers under the "bags as wheat" system, making the total cost to farmers £44,026 15s. 2d. To this must be added about 2½d. per bag for stacking, shipping, &c., £22,013 7s. 3d., or a total cost from the time it leaves the winnower until it is put aboard the ship of £66,040 2s. 5d. Now, according to a report by Dr. Cobb, an expert of the New South Wales Agricultural Department, the cost to the American farmer of handling the same quantity of wheat from the winnower to the ship under the elevator system would be £22,013 7s. 3d., being a difference in favor of the elevator system of £44,026 15s. 2d., or the total cost of the bags, the charges being ½ cent. per bushel for receiving, and ½ cent. per bushel for cleaning. No charge whatever is made for shipping. Storage charges are, I think, high, being fifteen days free, and ½ cent. per bushel for every additional fifteen days. This, however, is a matter which need not be dealt with here, storage in all cases being optional.

Dr. Cobb goes on to say—"That these prices show a profit is proved by the number of elevator companies competing for grain at these rates. No doubt with a trade of less magnitude the charges would have to be higher." Well, we could well afford to pay a higher rate and still save money.

Dealing with the cost of construction, Dr. Cobb says—"The terminal elevators now in process of construction in the United States are costing about 30 cents. per bushel of capacity. Previous to the recent advance in price of all kinds of materials, terminal elevators were built at from 20 to 25 cents. per bushel. . . . The country elevators, such as are used in the principal wheat areas of the United States, have a capacity of 20,000 to 40,000 bushels, and are constructed at from 15 to 20 cents. per bushel, according to size—20 cents. for the smaller size and 15 cents. for the larger size." Dealing further with these country elevators, Dr. Cobb says—"Of these 100 to 200 of 20,000 to 40,000 bushels capacity, would be required to meet the needs of New South Wales." He ranks this as by far the most important feature in the system, and says—"It is a lack of appreciation of the logical order of things and an ignorance of the importance of country elevators that has hampered the progress of the elevator system outside the United States, whence it is destined to spread to all grain producing countries where labor is expensive. Dr. Cobb estimates the cost of inaugurating wheat elevators in New South Wales at £400,000. Allowing that the inauguration of the system here would cost £500,000, we could pay, in addition to the American charges, 4 per cent. interest (a very substantial increase) on the total cost of inauguration and still save £24,000 on last year's operations. I would also ask you to bear in mind that, included in the American charges is a sum of ½ a cent. per bushel for cleaning. Now our wheat has competed for something like fifty years in the world's market against all comers just as it comes from the winnower, and there is no reason why it should not do the same under the elevator system. Consequently this charge could probably be done away with.

The Editor of the *Journal of Agriculture and Industry* of May, 1900, page 811, says "It would appear to us that the advocates of the elevator system of handling wheat overlook the fact that while its adoption would cost many thousands for fitting up central elevators, receiving stations, farm wagons, railway trucks, &c., the total wheat exported from any one port in Australia is too small to profitably employ a single large elevator for more than a few weeks." In my humble opinion this is no argument at all against the system. Elevators need not necessarily be large, but only large enough to meet requirements. They are built in America to deal with as little as 5,000 and 10,000 bags, and are worked profitably. Then why not here? The cost of handling would probably be higher, but as already shown, we could afford to pay higher rates and still save money.

It has also been argued that grain could not be safely shipped in bulk from this colony, and that bags would have to be provided to get the wheat to the English market. This difficulty has also apparently been overcome; as according to the *Adelaide Observer* of June 30th, 1900, a Mr. Sinclair, who is now on his way from England to the United States to join the Victorian Commissioner for the purpose of inquiring into the American system of handling wheat,

states on the authority of the chairman of the Elevator Company of Liverpool, that since January, 1900, no less than sixteen vessels have reached Liverpool from the River Plate, having on board no less than 30,000 tons of wheat shipped in bulk without bags. These shipments were experimental, and have proved entirely successful. The cargoes were mixed ones, including live stock. In face of these statements there is apparently no reason why the system should not be equally successful here; and while I think it would be unwise to blindly adopt the system, I trust that every farmer in the colony will do his best to help on the agitation until our Government have instituted a thorough and searching inquiry. Should it unfortunately be proved that no gain can come of it, but little harm will result. But if, on the other hand, we can make a profit, then so much the better for us.

COMING SIZE OF WHEAT BAGS.—Mr. J. Whyte thought the size of wheat-bags should not be above 3bush., and the shape the same as at present. Messrs. Turnbull and Carr thought it was never intended by nature that a man should carry twice his own weight, and Mr. Carn quoted the opinions of several medical men that carrying heavy bags of wheat is injurious. By vote it was decided that it is desirable that the size of wheatbags ought to be reduced.

HORSES.—Mr. A. Robb read the following paper:—

The class of horse which is of most interest to the farmer is, perhaps, the draught horse, the three principal breeds of which are the Shire, Clydesdale, and Suffolk. It depends upon whether the farmer intends breeding for the market or for his own use as to what style of horse is best to breed. It intended to be sold it is almost impossible to breed a horse too big, so long as he has legs and feet good enough to carry his weight. Of the three above-named breeds the Shire is by far the heavier animal, but the Clydesdale has the advantage of quality undoubtedly. A very good draught horse can be bred by using a Clydesdale sire and a Shire mare, and so combining the good qualities of both breeds. A good big draught horse will always sell well. One possessing size, weight, soundness, elastic joints, hard flat bone, good big wearing feet, combined with good action and docility, is what is required. The heavier animals push their load by leaning into the collar, while the smaller and more active ones have to dig their hind toes into the ground to obtain a fulcrum, and employ more muscles in starting a heavy load. Suppose we take a small horse and put him in the shafts of a trolley with two or three tons behind him, we find him completely lost. He does not fill the shafts as he ought to do, and this is especially so at any time when a bit out of condition. Then he has not the weight in him to put into the collar, and when this is wanting, no matter how correct his pasterns, or how well distributed his lifting power, he fails to move his load. Again, we take him—as we often see big horses at our railway stations—to shunt or move passenger carriages or goods wagons, the size and weight to put into the collar are just as necessary. I know that those who are in favor of the smaller and more active sort will say—"Well the smaller horses will go over the ground twice, owing to their greater activity, whilst the heavy clumsy one is going his journey once; or, again, you can have two instead of one." Now this latter observation is a very important one, as it is the horse that is big enough to take the heavy load by himself that is valuable, and why will be easily explained. To begin with, a less amount of stable room is required for one horse than a pair. Again, in the present congested state of the traffic in the streets of the large towns, two horses only add to the trouble, and precisely the same difficulty would obtain on the railway were two moderately-sized horses required to move the load. They would be continually in each other's way. This state of things, too, is likely to become more pronounced in the future than it has been in the past, owing to the rapid increase of population. In the breeding of such horses the farmer will require to use a good deal of discrimination. He will not have to breed in the haphazard fashion adopted by many farmers of putting all or any of his mares to any horse, by preference the cheapest. He will have to select his mares and use the best horse he can procure.

High-standing roomy sires should nick well with short-legged compactly-built mares, and *vice versa*. One thing the farmer should be sure of is soundness in both sire and dam. Plenty of horses go unsound without breeding from unsound ones. A good draught entire should not be too long in the back, well ribbed up, stand on a good set of legs, good big feet, not too flat or upright, with plenty of width of heel, knees and hocks large and well formed, possess plenty of weight, and be fairly active. He should stand not less than 17 hands, and have 11in. or 12in. of bone below the knee; his action all round should be straight and true. It is important that he should be able to work well; he should have a good masculine head, well set on; he should be thoroughly sound, and carry a veterinary certificate to that effect; he should have the power of impressing his own good qualities on his progeny, and not only sound himself, but descended from good and sound parents. Far too frequently farmers study the fee instead of the horse. Another of the secrets of breeding a good horse is having a good mare. If the farmer on the other hand is breeding horses for his own farm work, he certainly requires to breed a much more active animal. Implements are yearly becoming lighter, and there is not so much carting of heavy loads as in a town. But still, although he requires a smaller horse, there is no need for him to breed from any scrubber, and so let his horses become smaller

simply through deterioration. He can accomplish his object by using a thoroughbred or roadster. Very good farm horses are bred by using a blood horse and a draught mare, also by using a draught horse and a half-bred mare, although some people prefer the former. There are far too many worthless entire kept at the present time. All entire ought to be passed by a vet. before being allowed to travel.

The first winter in a colt's life decides what he is to be. Nothing you can do afterwards can ever repair the time lost if the foal is not "done" well his first winter. I have heard it disputed, but assert it all the same. To the unconvinced, I would point to the racing stable, and ask how it is that the thoroughbred is fit for the most exhausting labor, and nearly as tall as he ever will be, when draughts, halfbreds, etc., are only just being broken in, with the promise of being turned out again for another spell—a promise, alas, too often broken—and with the inevitable result that the youngster has no action, speed, or endurance when he is five or six, but very likely many unsoundnesses. The racing owner and trainer are heard to say they would feed on "sovereigns" if they would be any use; but what they do is to offer crushed oats or coarse oatmeal mixed with chaffed grass or other easily-digested green feed as soon as the foal can be induced to take it. With the taste once acquired, the foal soon learns to supplement his mother's milk, and his ration is only limited by his capacity for digestion, which latter is most carefully noted. We do not do this sort of thing on the farm. We think we cannot afford it. But are we right? I venture to think that a few bushels of crushed oats expended on a foal during his first autumn and winter will do more for him than as many bags another year. Advocates of the "let-em-chance-it" system will fall back on a bastard science, and tell you that the digestive organs are as yet unfitted to assimilate hard corn, and that it is unnatural forcing. It is possible of course to overdo it, especially with very heavy foals; they have not the inherited capacity of early feeding of horses of Eastern blood; but there is very little danger with men who farm for profit being so rash as to waste corn in that direction. The colt will soon tell you if he is getting too much; he will lack belly, and no young thing can thrive without a certain, nay, a considerable amount of extension. What we commonly see are potbellies and razorbacks, the foals barely holding their own during winter, when they should be making growth of bone both in length and tensity, and so ready to profit by the growth of grass.

If the separation from the dam is gradual, the intervals each day being longer, the suppression of milk will be gradual also, and the mare indifferent about yielding it when the foal nips her hardened udder. The rattle of the corn dish gradually becomes more attractive than the winny of the mare, provided the youngster is provided with society of his own age. Some discrimination is needed here, as if heavy draughts are run with light stock, the latter will run the others off their feet if in a large paddock. There is no doubt if an animal is to pay his way he had better not be coddled too much, or he will never become hardy; but in his first winter, if there is no natural shelter, some should be provided, or he will grow fluff and feathers to keep the cold out instead of making bodily growth. That food must be consumed to make heat we all know now; it is no longer a theory. Dairymen have proved it. In a warm house the cow gives more milk on the same ration than she will in a cold one.

It is a noteworthy fact that oats provide nearly all the elements for building up a good frame. At the present time the horse market has considerably improved, owing to the presence of agents buying for the Imperial army. The demand is likely to continue. And as almost every class of horse is required for one purpose or another, farmers possessing good sound mares suitable for breeding ought not to part with them.

The remount horse is probably the one most in demand, and there is good reason to believe that, with the conclusion of the Boer war, the pony remount will occupy its proper place in the British army. History and the present war have conclusively proved that the pony can accomplish things which are popularly supposed to be only within the province of the larger horse. The larger horse is no doubt more imposing in a review, but for practical warfare the points are greatly in favor of the pony. No doubt the type of pony that will find most encouragement will be the polo type, which is active and capable of carrying weight without discomfort. One thing I have forgotten, i.e., color. I estimate a good horse of any color in the scale of his goodness only.

STUMP-JUMP PLOUGHS.—Most of the members thought there is still room for improvements in these ploughs.

Albert, July 7.

Present—Messrs. J. Wetherall (chair), F. Dragomuller, G. Holmes, W. Farley, C. Setterberg, R. C. Morton, R. P. Barnett, R. C. Rassmussen, H. L. Smith (Hon. Sec.), and two visitors.

ANNUAL REPORT.—The Hon. Secretary's Annual Report showed that during the year seven meetings had been held, with an average attendance of eight members. Two papers had been read and discussed, and various matters

of practical interest dealt with at their meetings. The Branch co-operated with Swan Reach Branch in holding a show of the produce of the district at Swan Reach in September, 1899. Messrs. G. Holmes and C. Setterberg were elected Chairman and Vice-chairman respectively for ensuing year, Mr. H. L. Smith being re-elected Hon. Secretary.

DAIRY BULLS.—It was resolved that the suggestion of the Central Bureau that the department should subsidise amounts raised by branches for purchase of dairy bulls, &c., instead of purchasing the bulls as in the past, meets the approval of this Branch.

APRICOT TREES DYING.—Mr. Wetherall inquired cause of apricot trees dying on limestone soil. [Probably too dry and poor soil —GEN. SEC.]

Murray Bridge, July 11.

Present—Messrs. B. Jaensch (chair), W. Lehmann, J. Stecker, W. Schubert, J. G. Jaensch, H. Block, W. F. Wundersitz, H. Schubert, A. G. Kutzer, R. Edwards (Hon. Sec.), and about twenty visitors.

EARLY WHEAT.—Mr. W. Schubert tabled samples of King's Early and Steinwedel wheat about 3ft. 3in. in high and very healthy. The crop had been manured with superphosphate. He also showed fine Swede turnips grown from Bureau seed.

CO-OPERATION.—Mr. Clement Giles, M.P., Manager of the S.A. Farmers' Co-operative Union, gave an interesting address on this subject.

Wilmington, July 9.

Present—Messrs. J. Hutchens (chair), J. Schuppan, M. Gray, J. Hannagan, W. Slee, J. Lauterbach, R. G. S. Payne (Hon. Sec.), and three visitors.

DAIRY BULLS.—It was unanimously resolved that the resolution passed by the Central Bureau touching the purchase of pure-bred bulls upon the subsidy system meets with the approval of this Branch.

SPARROWS.—Mr. Gray reported that he had not seen a single sparrow about his place since laying poison, as reported at previous meeting.

DISCOVERY OF PHOSPHATES.—Mr. Schuppan asked whether some samples of raw materials could not be obtained by the Branch for the guidance of persons prospecting for deposits of mineral phosphates. It was decided to ask if the Inspector of Fertilisers could supply samples? [No; he has no means of obtaining samples for this purpose. Besides phosphatic rocks occur in so many different forms that a very large number of samples would be required.—GEN. SEC.]

GRAFTING FRUIT TREES.—The Hon. Secretary gave very practical demonstrations of the different methods adopted in grafting fruit trees, including bark, wedge, whip, and root grafting.

Onetree Hill, July 6.

Present—Messrs. J. Bowman (chair), F. Barritt, A. Adams, J. Flower, A. H. Riggs, F. Bowman, G. Bowman, and J. Clucas (Hon. Sec.).

DAIRY BULLS.—Members were generally of opinion that instead of looking to the Government for assistance in the matter of purchasing dairy bulls, a better plan would be for each Branch desiring to obtain the services of a good animal to secure it themselves.

JERSEY v. SHORTHORN DAIRY CATTLE.—Some discussion took place on this subject, and it was stated that the saving in cost of keep of the former would more than compensate for the slight shortage, if any, in returns; or in other words twenty-five Jerseys would consume no more than twenty Shorthorns, and the total yield would be all in favor of the Jersey.

MOON THEORIES.—Members considered the question as to whether there was less risk of loss in cutting and tailing lambs during a waning moon than during a growing moon too occult for them, though there might possibly be something in a theory so long held. [Moonshine.—GEN. SEC.]

Auburn, July 12.

Present—Messrs. G. R. Lambert (chair), W. R. Klau, J. E. Isaacson, P. Cornwall, O. C. H. Limbert, J. Hean, J. T. Kirkbright, J. W. Yeatman (Hon. Sec.), and one visitor.

OFFICERS.—Mr. G. R. Lambert and Dr. Yeatman were re-elected Chairman and Hon. Secretary respectively for ensuing year.

FODDER GRASSES.—Mr. Isaacson reported his intention of putting in half-acre plots with Prairie grass, Johnson grass, and lucern; the land was near the River Wakefield, and had been well worked. He would report results to members at future date. Dr. Yeatman reported that an eighty-acre section planted with rib grass three years ago stood two very dry seasons, but had been killed out this winter, so much so that only a very few tufts could be found.

Carrieton, July 12.

Present—Messrs. W. J. Gleeson (chair), M. Manning, W. H. Byerlee, A. Steinke, W. Steinke, F. Kaerger, R. Fuller, J. F. Fisher, H. Menz, and J. W. Bock (Hon. Sec.).

BULLS.—Members all agreed that it is desirable that Branches of the Bureau should purchase pure-bred bulls, stallions, rams, hogs, &c., and receive a State subsidy of £1 for each £1 raised by subscription for such purposes.

BUNT.—Mr. Kaerger read a paper on "Bunt." He said it does not matter how strong may be the bluestone pickle, if the weather is not favorable, there will be more or less bunt. If land is ploughed wet after lying uncropped for several years, and is sown with perfectly clean seed, pickled with 1lb. or more of bluestone to the bag, there will be more or less bunt if half an inch of rain should fall before it is harrowed in. [If perfectly clean seed is used it is impossible that bunt can appear, because bunt proceeds or grows from a distinct spore or "seed," just as surely as wheat grows only from a seed.—GEN. SEC.] He said there were some varieties more liable than others to be bunted, and it would be well to find out which are the varieties. Mr. Manning said he had been farming in the colony fifty years, and by using good bluestone and pickling on a good floor he never had trouble with bunt. Messrs. Fuller, A. Steinke, and Gleeson never had trouble with bunt when they pickled their seed properly. Mr. Fuller does not pickle when about to sow in dry soil. Mr. Menz thought perhaps the nature of the soil on some farms might have something to do with the prevalence of bunt.

DAIRY CATTLE AND DAIRYING.—Mr. Gleeson read a paper on this subject to the following effect:—

The first step is to secure the best cows. He preferred the milking strain of Shorthorn cows crossed with Jersey, as this would give a larger and hardier animal. One good Jersey bull would be sufficient for two or three farms. Cows should come in about beginning of

April, as butter brings the best price at that time. It is a great mistake to run the bull with the cows at all times. The dairyman must not be afraid of plenty of work, and must be prepared to attend constantly to it, and to provide feed for his cows. This can often be done without cutting cultivated crops, as there are seasons when the luxuriant natural herbage can be cut and put in silo pits or stacks. Good straw might also be used by layering with the silage. Cows must be milked regularly at fixed hours. A separator must be kept, as it saves an immense lot of work, and in the hot weather cannot be dispensed with. This implement must be kept scrupulously clean. Of course cleanliness in every place is an absolute necessity. For calves the skim milk should be mixed with an equal quantity of unskimmed milk for the first week, and gradually the quantity of skim milk can be increased. A few pigs should be kept. It is a great mistake to overstock any farm.

Mr. J. W. Bock favored Shorthorn cows, because they are larger than Jerseys, give a good lot of rich milk, and they may be sold for beef. Mr. Byerlee and Mr. Kaerger advocated Herefords, as, if taken quietly, they become much attached to the milkers, and give a fair quantity of milk.

RAINFALL.—Hon. Sec. said the rainfall for first six months of this year was nearly 6in.

STANDARD BUSHEL.—Members think that a fixed standard of average quality bushel of wheat should not be above 63lbs.

REMOUNTS.—Mr. J. F. Fisher said the German Government proposes to purchase cavalry remounts in Australia, and farmers here should breed good and useful horses, and try to reap the benefit.

Colton, July 7.

Present.—Messrs. P. P. Kenny (chair), A. C. Riggs, W. J. Packer, E. Whitehead, M. S. W. Kenny, W. McK. Elder, R. Hull (Hon. Sec.), and three visitors.

OFFICERS.—The Chairman and Hon. Secretary were thanked and re-elected.

BULLS.—Members are in favor of a subsidy of pound for pound raised by subscription by Branches for purchase of pure-bred dairy bulls, in place of bulls being purchased wholly and loaned by the Department of Agriculture.

MAIL COMMUNICATION.—After considering a letter from Elliston Branch *re* steamer between Port Adelaide and West Coast, it was decided to enlist the sympathy of the members of Parliament representing the district.

WOOL SHIPMENTS.—Referring to a proposal made some time since to ship wool direct to manufacturers, Mr. W. L. Brown read a letter from a brother engaged in a Scotch wool manufacturing establishment, showing most conclusively that it is not possible for manufacturers to purchase wool direct from the growers, as they must select the particular classes of wool for each particular class of work.

CROSS-POLLINATION OF WHEAT.—Mr. W. C. Packer read the following paper :—

The question was asked at last Bureau meeting as to the means adopted to cross-pollenate wheat. The following, I think, will make it clear to all. I have divided it into two parts :—**Natural Pollination.**—The florets of wheats are flowers much like those of most other grasses. The two scales of chaff cover the three anthers, which are sack-like organs containing the male pollen germs, and the female organ, called the ovary, with its feather-like stigma extending upwards between the anthers. The wheat has a strange habit of flowering during the earliest dawn. The scales of chaff begin to spread at their upper ends. In twenty minutes they will have spread at an angle of 30°, and in a similar length of time the flowers will have closed again. During the opening the anthers have made an attempt to get out. The filaments, or little stems that bear the anthers, rapidly lengthen, and some of the anthers are pushed out of the open flower to hang down outside when the chaff has closed. While being pushed out the anther sacks are burst open, scattering pollen inside the flower, and in many cases outside also. The stigma also spreads out to receive the pollen, and the chances are that numerous pollen from the same flower get an early lodgment on the moist surface of the stigma and very soon germinate, one or more sending down a pollen tube to the female

germ—the ovule—and thus causing the flower to be self-fertilised. Doubtless in an occasional flower a pollen grain from an adjacent plant first reaches the ovule, and cross-fertilisation results. How frequently this occurs is not known, but certainly not as frequently as the free opening of the flower early in the morning would lead one to suppose. Crossbred plants in fields of mixed grain are rarely seen, even between varieties which are successfully crossed by hand. **Artificial Crossing.**—The work of cross-pollinating wheat artificially is very simple, yet the florets are so small that to do the work rapidly and accurately patience must be exercised and manual skill must be developed, and, as a rule, numerous flowers must be cross-pollinated to get one cross-fertilised seed. Small-pointed forceps are used to pry open the floret and reaching in to pull out the three anthers. This must be done just prior to the flowering period of each particular floret, that none of the anthers may have opened and caused self-pollination of the flower. The stigmas must then be supplied with pollen from the plant with which the cross is to be made.

Stansbury, July 7.

Present—Messrs. A. Anderson (chair), P. Anderson, C. Faulkner, J. Henderson, G. Brundle, G. Jones, and P. Cornish (Hon. Sec.).

WEATHER REPORT—During the past month we have had splendid rains, which have been of great benefit, giving the land a good soaking. Rainfall for June:—At Stansbury, 2.59; at Dalrymple Station (about four and a half miles west of Stansbury), 3.04. The crops are looking well, and feed is getting plentiful. So far this is the best season we have had for a long time.

PURE-BRED BULLS.—Letter read from Central Branch, *re* pure-bred bulls. After an animated discussion on this subject, in which members all agreed, Mr. P. Anderson proposed, seconded by Mr. C. Faulkner, that this Branch does approve of the Government spending public money on matters like this, but should be left to the farmers themselves. Carried.

ARTIFICIAL MANURES FOR THE ORCHARD AND VINEYARD.—Mr. P. Anderson brought forward the subject of artificial manures for the orchard and vineyard for discussion, and would like other Branches to give their experiences; for, although this subject has been dealt with before, there is still very much to learn, and those who have experimented can greatly help others by giving their results as to the different kinds of super., guano, bonedust, or anything else that may have been tried and been beneficial; also in the different districts there may be different results.

Mount Pleasant, July 13.

Present—Messrs. G. Phillis (chair), H. A. Giles, H. Dragomuller, F. Thomson, J. Maxwell, W. Vigar, W. Lyddon, P. Miller, J. F. Miller, J. A. Naismith, R. Godfree, H. T. Hull (Hon. Sec.), and one visitor.

RAIN, CROPS, &c.—Rainfall for June, 3.60in. Crops are at a standstill. Feed growing well, and stock improving. Retiring Hon. Secretary thanked and Mr. H. A. Giles appointed Hon. Secretary *pro tem*.

Mallala, July 9.

Present—Messrs. G. Marshman (chair), H. B. Moody, S. Temby, A. F. Wilson, F. M. Worden, J. Jenkins, A. Moody, G. W. Bischof, W. Temby, W. R. Stephenson (Hon. Sec.), and two visitors.

BULLS.—Members prefer to have bulls on loan to Branches in place of purchasing by subscription with a State bonus of pound for pound.

EXHIBITS.—By Mr. Bischof—Sample of Newman wheat, 4ft. high, in ear, sown after first rains in March, with 2cwt. per acre of Reliance super. By Mr. S. Temby—A Cocozelle marrow, about 9lbs., grown from Central Bureau seed; also a very large pumpkin.

Nantawarra, July 11.

Present—Messrs. Jas. Nicholls (chair), A. F. Herbert, R. Uppill, C. Belling, J. W. Dall, S. Sleep, A. L. Greenshields, R. Nicholls, W. J. Spencer, and four visitors.

WOOL-CLASSING.—It was decided to endeavor to arrange for visit and lecture by Mr. Geo. Jeffrey.

DAIRYING.—Members were of opinion that in those districts where the bulls owned by the department had been stationed for two years there would be several half-bred bulls which could be used by the owners until better stock could be secured.

MANURES.—Mr. Sleep asked whether English super. was suitable for stiff clay patches. Members considered it largely depended upon the rainfall. Some years the rainfall suits these stiff clays better than others, and when it is favorable super. gives good results.

CLEANING SEED WHEAT.—Mr. Dall stated that although his seed wheat looked clean enough he put it all through a drake sieve, and was surprised at the quantity of small grain it removed. He felt confident that the extra labor involved was repaid in the returns from the crop, as he concluded that the best seed produced the best plant; the refuse was fit for fowls, pigs, &c.

WHITE MILAN TURNIP.—Mr. Uppill tabled good samples of early White Milan turnips from Bureau seeds, each root weighing 1lb. 5ozs. He sowed the seed mixed with a little super. and sand, on Good Friday, April 13th, on fallow land, and, although the plants made but little top, they had produced splendid turnips.

Mount Remarkable, July 12.

Present—Messrs. A. Mitchell (chair), G. Yates, W. Lange, C. E. Jorgensen, T. P. Yates, J. B. Morrell, H. Humphris, D. Roper, T. S. Bishop, T. H. Casley (Hon. Sec.), and two visitors.

DAIRY BULLS.—Resolutions of Central Bureau *re* department subsidising amounts raised by Branches for purchase of pure-bred bulls were discussed at length, but decision postponed.

FIELD TRIAL.—Arrangements have been made for a trial of seed and fertiliser drills at an early date.

Angaston, July 4.

Present—Messrs. J. E. Swann (chair), S. O. Smith, E. Thamm, R. Player, A. Salter, P. Radford, J. Vaughan, A. Friend, F. Thorne, W. Sibley, A. Sibley, J. H. Snell, E. S. Matthews (Hon. Sec.) and several members Lyndoch Branch.

VISITS OF INSPECTION.—Members visited the gardens of Messrs. A. Salter, Smith & Sons, W. Trescowthick, and Trescowthick Bros., inspecting the various items of interest.

PRUNING.—Practical demonstrations of various methods of pruning of fruit trees and vines were given by Messrs. S. O. Smith and E. Trescowthick, and proved of great practical value. In the evening Mr. Smith gave a paper on this subject, with practical demonstrations.

STORING OF APPLES.—During the day members saw immense quantities of Cleopatra and Dunn's Seedling apples stored in well-ventilated stone buildings in heaps 3ft. to 4ft. deep, and all in splendid condition. In reply to questions, Messrs. Trescowthick stated that when carefully stored in this way not 5 per cent. of the fruit suffered from decay.

CANNING OF FRUITS.—Messrs. Smith & Son's Yalumba factory was visited, and the canned fruits inspected. The visitors were greatly impressed with the possibilities of the district should the proposed railway be constructed.

DRAUGHT HORSES.—In the evening Mr. A. Salter read an interesting paper on this subject, which was well discussed. Mr. Salter advocated chaff and crushed wheat, but the concensus of opinion was in favor of chaff, bran, and crushed oats, the latter being considered essential in the feed of working horses.

Morgan, July 7.

Present—Messrs. R. Windebank (chair), H. Hahn, E. Jacobs, C. Moll, J. Aurndt, J. G. Roediger, R. Wohling, J. Bruhn, and J. Wishart (Hon. Sec.).

STRYCHNINE.—Mr. Jacobs wished to know the surest way of destroying strychnine in the pots or left on sticks that were used for mixing poisoned baits for rabbits. He had been told that burning did not destroy the poison. [Burn the sticks and scatter the ashes well, and there will be no danger of anything coming to harm. To clean the pots add one teaspoonful of strong acetic acid to a pint of water; boil in the pot, and allow it to stand for twenty-four hours. This acid solution will dissolve the strychnine, and will itself be very poisonous and must be kept out of reach of children or animals. To dispose of this liquid, dig a trench and pour it in.—GEN. SEC.]

DISEASE AND DEATH IN DAIRY HERDS.—The Hon. Secretary read a paper on this subject to the following effect:—

The necessity for considering this matter has been brought very forcibly before us this season, and its importance can hardly be disputed. If we were in business of any description and lost say 10 per cent. on our capital through mistake or misfortune we would consider it a serious matter indeed, yet in many districts farmers dependent almost entirely upon the produce from their dairy herds have lost, not one in ten, but in many cases eight or nine out of ten cows. The question then for us to deal with is how to prevent such loss in the future. I do not say how to cure the disease, because I think prevention and not cure is the only remedy. Cases of cure have been very few and far between. Described in plain language, the symptoms of the disease are—Loss of power to walk, stiffness of limbs, loins or back, usually, but not always, in the hind-quarters. The conviction is forced upon us that the seat of trouble is in the stomach. I believe an aggravated form of indigestion is the cause of the losses. The indigestion is, I believe, brought on by the cattle having to subsist for so long a period on food deficient in vegetable juices or sap; in many cases it has become simply straw, fibre or stick. It may have been good grass or herbage at one time, but the nutritive properties have perished. We are all aware that with the winter rainfall comes the growth of herbage, grass, &c. In July or August the stock begin to do fairly well on it, improving till November, when feed is at its best. From December to January it begins to get very dry, but is still good. Later on in the hottest months, we often have a heavy fall of rain, and this seems to destroy the dry feed entirely, leaving it little better than fibre. The fall is rarely sufficient to do any good, though in districts with a better rainfall this may not apply, as often growth that would hardly be classed as good feed is taken by stock almost as medicine. I have often observed that stock about the township in February or March will make great efforts to get at any green stuff growing in the gardens, breaking down fences in their efforts. They will also devour any green plants from the garden that may be thrown away, owing, I believe, to their natural craving for some succulent food to relieve the parched condition of the first stomach. Soon after I took up land here a number of fat cattle on their way to the Adelaide market were kept here for some weeks, and though there was fairly good dry feed available and bush abundant, a number of them died. As far as could be ascertained this was due to the fact that having been travelling on hard fare for a long while their digestive organs were impaired, and not capable of standing the extra strain caused by filling themselves up with dry feed. Their own stock were in somewhat similar condition.

Now what possible remedy is within the reach of us all. Most of us know that a good supply of green hay or bran food would do much to remedy this state of affairs. Then, again, with an irrigated plot watered from our noble river there was no limit to the variety of green feed that could be grown to supply their wants; but "hope deferred" in the matter of irrigation not only "made the heart sick" but the cattle also. Thus our possibilities are narrowed down, though a few may be suggested. First let us make up our minds to cut all hay in

greener condition in the older farming districts the presence of wild oats makes this necessary—and then spare some of it for the cows, even if scarce and much needed for other stock. Again, the string-binder might be utilised to harvest some of the wheat crop before the whole of the sap, &c., is lost from the straw. In addition, could not many of us reserve a paddock in a good season and mow it for grass hay or ensilage, the bush of course being removed first. Some years ago I saw a quantity of the natural herbage preserved as ensilage by building it up and treating it well in a square stack and then weighting it well with logs of wood. Almost any green vegetation can be saved in this way, and would help to keep stock in good condition. Sufficient weight to expel the air was the great essential with stack ensilage.

Considerable discussion ensued, members generally agreeing with the main points of the paper.

Strathalbyn, July 9.

Present—Messrs. M. Rankine (chair), Hon. J. L. Stirling, M.L.C., D. Gooch, W. M. Rankine, P. Cockburn, and J. Cheriton (Hon. Sec.)

BULLS.—The experience of this Branch, both from giving a prize for a stud bull and from the location of a Government bull in this district, has been disappointing, and the results do not warrant the expenditure of money by the Government where the public are too reluctant to make full use of such advantages. This Branch cannot recommend the adoption of the suggestion of the Central Bureau. [The suggestion was that instead of the department lending a bull to any Branch, each Branch should be encouraged to purchase its own pure-bred dairy bull, but should receive a subsidy of one pound for each pound raised by subscription for such purpose. About 80 per cent. of our Branches strongly approve of that suggestion.—GEN. SEC.]

EXHIBITS.—The Hon. J. L. Stirling tabled some plants of the Chinese cabbage (*Brassica chinensis*) which grows luxuriantly and is ravenously eaten by stock; also a weed, not in flower.

Richman's Creek, July 9.

Present—Messrs. W. Freebairn (chair), A. Knauerhase, E. Roberts, F. Mattner, P. J. O'Donohue, J. McSkimming, W. J. Wright, J. A. Knox, J. M. Kelly, J. J. Gebert, J. McColl (Hon. Sec.), and one visitor.

DAIRY BULLS.—It was unanimously resolved that this Branch supports the suggestion of the Central Bureau, that Branches requiring the use of stud bulls should subscribe at least one-half of their cost, and that the same principle should apply to purchase of entire horse stock, if it could be arranged.

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the year nine meetings were held, with an average attendance of 9.6 members. Four papers were read and discussed, besides which several members reported on their visits to other districts. The question of the profitable use of fertilisers for wheat crops in this district has received considerable attention during the past two or three years, and the fact that 11 tons of super. have been drilled in with wheat by different members is evidence that the visits paid to other districts and the discussions at the Branch meetings have borne fruit. Of course it remains to be seen what the result will be, though so far the Hon. Secretary's manured crop was giving every promise of profitable returns. In discussion on this matter the probability of the more general use of the seed and fertiliser drill in this district, should the present year's experiments be a success, was referred to.

OFFICERS.—Messrs. W. Freebairn, A. Knauerhase, and J. McColl were re-elected Chairman, Vice-Chairman, and Hon. Secretary respectively for ensuing year, and thanked for past services.

FALLOWING.—Mr. W. J. Wright read a paper on this subject. The question of the best treatment of the soil to prepare it for the ensuing crop must depend very largely upon its character and condition at fallowing time. Early fallow is usually considered best, as the longer the soil is exposed to atmospheric action the better, but he thought if the land were well ploughed while in good, friable condition time was not of so much importance, provided the work were finished before the rubbish commences to seed. There was great diversity of opinion as to depth to plough, but where the soil permits he favored deep ploughing, as allowing the moisture to penetrate better as well as retaining it. The clay should not be turned up on the surface, still the soil should be loosened at least 6 in. deep. The ordinary lever plough was very handy for regulating the depth while working, but it would be a decided improvement if a share could be fixed behind each plough to loosen the soil in the furrow without bringing it to the surface. It is often said, "It does not pay to crop any but fallow land," but where the land is strong he thought it a waste of labor to only take off one crop, as the second can be put in as a rule easily. With land dirty with oats it would be a good plan to plough it lightly during the summer to cover all the seeds. It is wise to scarify the fallow during spring, if not in too dry condition, but he did not believe in working it more than necessary to keep down the weeds. Which is the better practice, to plough under the herbage or feed it off before fallowing? If it can be properly buried the land benefits, and though there is less labor in feeding it bare with sheep he thought the latter practice would improve the land sooner. To be successful the land must be worked systematically. Two cereal crops in succession were sufficient, then graze lightly for two years, fallowing it the second year. Members generally agreed with Mr. Wright, but urged the advantages of early fallow. Land ploughed just before the rubbish seeds was not early enough to give best results; the value of the winter rains to the crop the following season can scarcely be overestimated.

EXHIBIT.—Mr. Mattner showed fine specimens of Snowball turnip grown by him near Bruce, the seed being sown after the middle of April.

Johnsburg, July 7.

Present—Messrs. F. W. Hombsch (chair), H. Napper, T. Thomas, T. A. Thomas, J. R. Masters, L. Chalmers, T. Potter, T. Johnson (Hon. Sec.) and two visitors.

DAIRY BULLS.—Members, after discussion, favored continuation of the present system of loaning bull to the Branches, but consider that no Branch should have the service of a bull belonging to the department for more than one year.

Forest Range, July 12.

Present—Messrs. J. Vickers (chair), A. Green, J. Sharpe, R. Townsend, and J. Caldwell (Hon. Sec.).

OFFICERS.—Messrs. J. Vickers and J. Caldwell were re-elected Chairman and Hon. Secretary respectively, Mr. J. Sharpe being appointed Vice-Chairman.

STATE ASSISTANCE TO PRODUCERS.—Members could not support proposal of Stockport Branch re excursion trains, as the demands for concessions from the State were becoming too numerous. For similar reasons proposal to assist Branches in purchasing pure-bred bulls did not meet with favor, members being of opinion that such should be left to private enterprise.

EXPORT OF APPLES.—The opinion was expressed that the reason our apples were preferred in London to Tasmanians was that most of them were picked and packed by the growers, who took more care than was taken when the packing was done by the wholesale shipping agents. [The fact is that a considerable bulk of the apples sent from Barossa District were picked and packed by the employes of the purchasing exporters, and not by the growers. A good many growers, however, in various districts, picked and packed their own fruit for export, and did it most creditably.—GEN. SEC.]

Morphett Vale, July 14.

Present—Messrs. L. F. Christie (chair), H. Anderson, J. McLeod, A. Pocock, F. Pocock, F. Hutchinson, and A. Ross Reid (Hon. Sec.).

LUCERN PEST.—Members reported that since their attention has been called to the presence of the *Smynthorus* pest in the adjoining district it had been noticed throughout the district. Mr. Pocock thought the frost would destroy the insects in the young crops, but not where there was much shelter. The Hon. Secretary reported that the only part of his crop badly infested was a small area not fallowed; they were not present in large numbers in the crops on fallow land.

QUESTIONS.—A number of questions were asked. Mr. Christie thought July the best month to sow field peas in this district. Rabbits are increasing in the district. Harrowing growing crops after heavy rain was favored. Mr. Hutchinson found August the best month to prune apples and pears in this district. Circular Head potatoes considered most suitable for district. Should be planted 1ft. apart in rows 2ft. 6in. apart; 11cwts. to 12cwts. seed per acre required.

Crystal Brook, July 14.

Present—Messrs. G. Davidson (chair), J. C. Symons, W. J. Venning, W. Morrish, R. Pavy, W. Hamlyn, P. Pavy, F. S. Keen (Hon. Sec.), and one visitor.

OFFICERS.—Messrs. J. C. Symons and R. Pavy were elected Chairman and Vice-chairman respectively, and Mr. F. S. Keen re-elected Hon. Secretary for ensuing year.

DAIRY BULLS.—Members approved of recommendations of Central Bureau *re* subsidising amounts raised by Branches for the purchase of pure-bred bulls.

SHEEP-BREEDING.—Mr. R. Pavy read a paper on this subject. Eight years ago he commenced experiments in crossing different breeds of sheep, principally with pure Shropshire rams, mated with Lincoln and Merino ewes. With the Lincoln cross the wool soon became so light and ragged as to be almost worthless. The Shropshire-Merino cross was much better, but still only averaged 6lbs. per sheep; still the lambs were all that could be desired for the butcher, being at four months quite equal to a five month Merino lamb. He still favored this cross for lambs for market, or if fat lambs is to be the main object in keeping sheep. He was, however, strongly of opinion that for all-round profit the pure Merino was best for the farmer. Under same conditions it will give 3lbs. per sheep more than the cross. Then a fairly good fence will keep them in the paddock, but with the crossbred you never know where to find them until you know where the best feed in the district grows. In any case if you want good sheep you must breed well, but good breeding will be useless without good feeding. Better to have a little feed wasted than have the sheep running over the paddock looking for grass and not finding sufficient

for their needs. Members agreed that the pure Merino was the most profitable all-round sheep, though the crossbred lambs were fit for the butcher at least a month earlier. Mr. Morrish asked if members could say why lambs should, shortly after castration, lose the use of their legs and then die. Members thought it due to frosty weather; the operation should be done during the dull weather. Ewe lambs have been known to go off in the same way after tailing. At four or five weeks lambs were best fit to operate on.

DRILLING v. BROADCASTING WHEAT.—Mr. Venning showed samples of wheat from seed broadcasted and from seed drilled in without manure, the latter being much better.

INCREASE IN WEIGHT OF FLOUR, &c.—Members cited cases which had come under their notice of flour, after being bagged, having increased 10lbs. to 16lbs. per bag. Wheat will also increase in weight after bagging at certain seasons of the year.

Redhill, July 12.

Present—Messrs. S. H. Treloar (chair), H. Darwin, W. Stone, R. T. Nicholls, R. H. Siviour, D. Steele, D. Lithgow, A. A. Robertson, F. Wheaton, and J. N. Lithgow (Hon. Sec.).

STANDARD WEIGHT OF BUSHEL OF WHEAT.—Mr. R. H. Siviour read a paper on this subject, advocating a fixed standard of 63lbs., and for each pound over that $\frac{1}{4}$ d. per bushel extra should be paid, with a like reduction for each pound under the standard. Purchased wheat should be graded by the buyers, and each grade branded and stacked separately. If such a system were adopted farmers would clean their wheat thoroughly, and the bulk of our wheat would average 65lbs. per measured bushel. Mr. R. T. Nicholls also read a paper somewhat opposed to that of Mr. Siviour. He could see no reason for fixing a standard of 63lbs. Following a wet winter the crops are often good, but the grain is light, although clean and bright, and may not weigh more than 62lbs. per measured bushel. In such a case the grower would have to submit to a reduction, and our wheat would be classed as inferior. He thought there should be a price for—and the merchants should buy—wheat from 58lbs., if cleaned properly [Certainly! The merchants will always buy anything they want; but if they cannot find purchasers for wheat under 60lbs. per measured bushel, there does not appear to be much inducement to buy it.—GEN. SEC.] He thought a high standard would be more favorable to the corn traders than to the farmers.

Tanunda, June 14.

Present—Messrs. J. H. Walden (chair), W. Gractz, A. Ohlmeyer, P. Trimmer, J. Gurr, G. Mann, E. Trimmer, and C. Heinemann (Hon. Sec.).

WHEAT FAILING TO GERMINATE.—Wheat when pickled with bluestone and mixed, whilst wet, with superphosphate, failed to germinate after being sown.

SPRAYING.—A discussion took place on this subject, dealing chiefly with composition of the mixtures and methods of application. Some members recommended omission of lime, on account of its neutralising effect on the bluestone and weakening its activity. [On the same line of argument why neutralise the strength of the sulphuric acid by the presence of the copper? Lime has been proved in many thousands of cases to be effective in combination with bluestone (sulphate of copper), for suppression of many fungus diseases. Why go back to exploded practices?—GEN. SEC.]

Bowhill, July 14.

Present—Messrs. A. Dohnt (chair), E. Wayland, J. McGlashan, W. Towill, C. Drogemüller, J. Waters, F. H. Baker, N. P. Norman, J. Gregory, F. A. Groth (Hon. Sec.), and seven visitors.

BULLS.—Members strongly favor each Branch purchasing their own pure-bred stud stock.

FIELD TRIAL.—About fifty farmers and others gathered to witness a trial of a five-furrow stump-jumping plough, fitted with paring mouldboards. The field was very rough and stony in places, and the implement gave much satisfaction. It was made by Mr. Tyler, Bowhill, who is fitting his ploughs with the patent "Boss" jumping patent, which is a great improvement on the old patterns.

POTATOES.—Mr. Drogemüller suggested that land should at once be prepared for planting potatoes, as there does not appear to be much likelihood of frost occurring.

COMBINED BRANCH SHOWS.—Mr. E. Wayland read a paper advocating combination amongst Branches of the Bureau for holding shows of agronomical products and home industries, as they encourage activity in all branches of rural industry. Good judges, however, should be selected; but this is not always done.

Tanunda, July 12.

Present—Messrs. E. Trimmer (chair), A. Ohlmeyer, C. F. W. Lehmann, G. Mann, and C. Heinemann (Hon. Sec.).

BUSINESS.—Hon. Secretary explained reason for non-appearance of report of meeting held June 14th was due to his illness. Many of the members were at present suffering from influenza, which was the cause of the small attendance.

Wandearah, July 9.

Present—Messrs. G. Robertson (Chairman), W. Halliday, E. H. Eagle, E. Jacobs, W. Munday, R. J. Dennis, W. Davidson, J. Kurl, J. Joyce, C. E. Birks (Hon. Sec.), and one visitor.

BULLS.—Members favor purchase of pure-bred dairy bulls for district service by subscriptions aided by a State subsidy of pound for pound.

SHEEP.—Mr. Dennis continued his remarks on sheep, dealing principally with crossbreds, which he considered most profitable for farmers.

Forster, July 10.

Present—Messrs. J. Johns (chair), J. Sears, J. Childs, W. Johns, F. Johns, A. Johns, C. Bolt, A. Schenscher, J. D. Prosser, F. Towill, J. A. E. Schenscher (Hon. Sec.); Messrs. E. Weyland, A. Dohnt, J. Waters, and W. Towill, of Bowhill Branch, with Messrs. J. L. Baker and L. Fidge, of Swan Reach Branch, and eight visitors.

COMBINED BRANCH SHOW.—Arrangements were made for holding a combined Branch Show of products and industries on September 28.

STORING WHEAT, FLOUR, &c.—The Hon. Secretary read the following paper:—

Where farmers are not in a position to erect a mouse-proof barn, and are obliged to store their seed wheat, flour, &c., in sheds, the following is the cheapest, simplest, and most effective way of storing to protect the same against mice and rats:—Stack the wheat, &c., as usual, leaving an open space of about 18in. around the sides; also between top of stack and

roof of the shed. After the stack is completed fill the open spaces in tightly with cocky chaff. This will prevent mice from entering the stack, and will keep the same secure for years. Care should be taken to prevent mice from entering the stack before the chaff has been packed. This can also be done in the open field, providing the stack is well-fenced and covered. Farmers who store their wheat with the wheatbuyers should store it in this way, as there is no expense connected with it, nor is there any loss of wheat, but the wheat will increase in weight. Bleached wheat, if kept long enough, will regain its original color, which would greatly add to its value.

Mount Bryan East, July 14.

Present—Messrs. T. Wilks (chair), Wm. Quinn, Wm. Dare (Hon. Sec.), and one visitor.

FALLOWING.—Decided that early fallowing is the best, but difficult to perform on account of the scarcity of feed. Early fallow opens the soil to the influences of sun, air, and reception of moisture, allows the clods to become disintegrated and the subsoil to settle down and to form the compact, though permeable, seed-bed necessary for the growth of a cereal crop.

Kanmantoo, July 12.

Present—Messrs. J. Downing (chair), T. Hair, F. Lehmann, E. Downing, T. Hawthorne, T. Lewis, A. D. Hair (Hon. Sec.), and one visitor.

BULLS.—Members are in favor of pure-bred dairy bulls being purchased by Branches with a subsidy of £1 for £1, with the conditions attached by the Agricultural Department.

QUESTION BOX.—Resolved to establish a question box as a trial.

THE POULTRY INDUSTRY.—Mr. J. T. Hair read an interesting paper on "The Poultry Industry of our Colony."

The poultry industry in these colonies is as yet in its infancy, and has a great future before it. The farmer, dairyman, and gardener, at no very distant date, will find it beneficial to give it a fair trial, because the present industries possess the necessary requisites for its development and success in the shape of cheap land, feed, and numerous other matters which cannot be disposed of at a profit in any other way. There are destructive insects in the garden, obnoxious weeds on the farm and waste lands, and curds and whey connected with the dairy, all of which constitute the essentials which assure success. The farmer of the future will find it to his interest to develop every branch of the farm to its utmost capacity if he would make his farm pay, and as an adjunct only can the poultry business be confidently recommended to either of the above branches of farm life. It is questionable if anything pays better, if economically and systematically conducted, because it is a product from which, at any time of the year, ready cash can be obtained especially when the market is near at hand. Few indeed have any idea of the magnitude of the ever gradual increasing demand for poultry and eggs. Good table birds are always eagerly sought after, and command remunerative prices even in our local markets; and the production cannot keep abreast with the demand, even here, for some years to come. The present abominable, weedy, puny mongrel submitted for sale is a disgrace to any community, and too frequently scarcely realises sufficient to pay carriage, commission, &c.; and too many in the past, who say "Poultry don't pay," have been established on similar experiences. What would become of our herds of cattle and sheep if allowed to associate indiscriminately, similarly to many of our flocks of poultry of to-day? Why, they would rapidly degenerate, deteriorate in value, and at length become unprofitable. [Here is related a case where one lady purchased a "goose" for 3s., and another a fowl, for 2s. at Christmas. On being weighed the fowl weighed 11lb. more than the "goose."—GEN. SEC.] At current prices for all grain the farmer would find the production of eggs and poultry highly remunerative and satisfactory. No farm is complete without a flock of good laying hens of the non-sitting variety, and, when properly attended to, would return more money than any ordinary farm crop. The eggs always find a ready sale, and are in demand. The chicks at five months are fit for the table, and are eagerly sought after (early ones), provided, of course, that they have been properly fed. Always bearing in mind that a "cow well and properly fed will be a good milk-producer," so with the poultry—the hens good layers, and the young surplus stock fit for table or market. The want of proper attention, lack of system and selection of our poultry on the farm, are alone very largely responsible for the many failures of the past; hence "poultry

don't pay." Inexperience, neglect, want of knowledge, method, cleanliness, over-crowding, in-breeding, keeping old hens that do not lay, want of economy in the distribution of feed, have also been disastrous to the success of poultry on the farm; and no industry, however valuable or desired, can succeed and prosper when conducted on these lines. Hens of a good-laying strain will lay from 150 to 200 eggs per annum, and even 220. Hens that do not lay 120 should be immediately disposed of, as they do not pay, and will consume all the profits. The prices realised for eggs during the past year, ending June 30th, in Adelaide, has been an average of 9½d. per dozen; so that after deducting, say, 1½d. per dozen for carriage, commission, etc., we have a nett profit of 8½d. per dozen. Hens that lay 120 eggs return, at 8½d. per dozen, 7s. 1d. per hen; 150 eggs, at 8½d., 8s. 10d. per hen; 200 eggs, at 8½d., 11s. 10d. per hen; 220 eggs, at 8½d., 12s. 11d. per hen. It will be seen at a glance which is the most profitable hen. The average price for the first quarter of the year, June, July, and August, was 9d. per dozen. September, October, and November, 5d. per dozen; December, January, and February, 7d. per dozen; and March, April, and May, 1s. 1½d. per dozen. Hatch the chicks during August and September and the pullets will lay during March and winter months, when eggs fetch the highest price; and "it is always the winter egg that determines which side of the ledger shall preponderate." The cockerels at this period realise high prices. "Poultry farming will also pay if in the hands of experts who breed largely for exhibition purposes, selling pure stock at good prices, and eggs for sitting; but this is a distinct branch, and it has only become successful after much patience, losses, and perseverance." So that from a scientific point of view, also, poultry will pay. Portable fowl houses are very serviceable, and will be found useful and convenient for distributing the flock over the stubble in sufficiently large numbers after stripping. By this means all the grains will be gathered and brought into account, the only labor entailed being in collecting the eggs, supplying the water, and removing the houses, the latter, perhaps, once or twice a week. Various advantages are connected with this plan—in fact, almost legion—and every farmer that I know of who has adopted this system has received very gratifying results.

In the discussion Mr. Downing mentioned that he had at present hens ten or twelve years old which were laying splendidly. He could give no reason, but thought it was because he fed them well.

FARM BUILDINGS.—Mr. Lehmann would be pleased to see prizes offered by the Royal Agricultural Society for the best plans for erecting farm buildings; economy of construction and provision for extension with uniformity to be considered.

OFFICERS.—Retiring officers thanked and the following elected:—Mr. Thos. Hair (Chairman), Mr. John Downing (Vice-chairman), Mr. F. Lehmann (Hon. Sec. and Treasurer), Mr. Thos. Hawthorne (Assistant Hon. Sec.).

Appila-Yarrowie, July 6.

Present.—Messrs. P. Lawson (chair), J. C. W. Keller, A. Fox, C. W. H. Hirsch, J. Wilsdon, J. H. Botttrall, N. Hannagan, W. Stacey, J. O'Connell, J. Daly, E. Catfort, W. C. Francis, and C. G. F. Bauer (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the year six meetings had been held, with an average attendance of over eleven members. Two papers had been read, and numerous matters of practical interest discussed. Mr. P. Lawson was elected Chairman, Mr. J. C. W. Keller Vice-Chairman, and Mr. C. G. F. Bauer re-elected Hon. Secretary for ensuing year, the retiring officers being accorded a vote of thanks for their services.

DAIRY BULLS.—Members were opposed to the department subsidising Branches purchasing pure-bred bulls or other stock.

TRIALS AND TROUBLES OF THE NORTHERN FARMERS.—Mr. J. O'Connell read a paper on this subject. The following is a short abstract:—

Like that of the policeman in the "Pirates of Penzance," the life of the northern farmer is not always a happy one. He occupies country which by nature is not fitted for agricultural occupation. It is a land of droughts, where the natural herbage has now been probably destroyed for all time, so that it cannot again be utilised for grazing purposes. When the late Mr. Goyder drew his line, northwards of which he said there was not sufficient annual rainfall for the profitable cultivation of wheat, many people believed him to be in league with the pastoralists; but sad experience has convinced present occupiers of that land that he was

correct. Many farmers who had comfortable homes southward of that fatal line sold out and purchased land to the northward of it, securing large areas at low prices, and imagined that their fortunes were secured. They took up with them live stock, implements, cash, youth, and energy. These men are now very much older, worn-out and dispirited, their cash and live stock pretty well gone, and their implements, &c., not too modern. They have nothing to sell except their improvements, and these would realise very little. Some people suggest Government aid, but how can this be afforded? Certainly not by loans or gifts of seed wheat, which, when sown will probably give no crop, judging by past experience of several years. The Government has no better land upon which to place them. [Mr. O'Connell then drew comparisons between the land occupied by pastoralists between Adelaide and Wilmington, and the country occupied by farmers to the northward and eastward of that place.—*GEN. SEC.*] Farmers in Appila could not imagine the straits to which those residents northwards of Goyder's rainfall line were reduced. Not only were there no crops produced, but their cattle and other live stock died; and when they tried to save a few by giving one-half to pay paddocking fees to their southern friends, the greater part of those they took back later on died after all. Many travelled their stock from place to place for months, only to lose them after all. Their wives and children were left at home without a cow, no milk, not even a fowl, watching and waiting, day after day, for the rain which came not at all; with very little to eat, and perhaps two or three miles to carry water by hand, because there was no horse to draw it. A farmer, who has experienced these troubles, told him that he once owned a nice farm in the south, but sold it and went to the north of Goyder's line. He took up thirty horses, fifteen cows, all necessary implements, and had £4,000 in cash. Now his cash, horses, and cattle were nearly all gone, and he is now prematurely an old man, simply through his reverses through drought. The man with 200 acres south of Adelaide is well off, even though he has not much money. He gets enough to keep him. He may sell milk to a factory, getting a few shillings each week; has a pig to sell sometimes; strips a few tons of wattle bark each year; keeps bees, fowls, &c.; but does not grow wheat, because it does not pay, and his expenses are not great. Is it a great wonder that the young people will not stay on the land in this northern country when they see how their parents fail to succeed? Surely they cannot be blamed for trying to find more comfortable quarters—the sooner the better for themselves.

Mr. Hirsch, from a recent experience of nine months in the locality referred to, confirmed Mr. O'Connell's remarks. Things are very bad there, but the farmers have not yet lost heart, and are still hoping for better seasons. A resident of fifty years' experience in that locality had told him he had never before known such a long drought as the present, and expected good seasons to come again. He thought farmers there should combine grazing with wheat-growing, but must have much larger areas to enable them to do that.

Pyap, July 18.

Present—Messrs. J. Bowes (chair), B. T. H. Cox, W. Axon, H. Mills, E. Robinson, A. J. Brocklehurst, C. Billett, J. Arnold, J. Napier, J. Harrington, J. Holt, W. C. Rogers (Hon. Sec.), and one visitor.

PRUNING.—A general discussion on the pruning of fruit trees took place.

WHITE MILAN TURNIP.—Mr. Cox tabled samples of this turnip raised from Bureau seed. It was a fine variety, with but few leaves and large root. He promised to save as much seed as possible. Mr. Brocklehurst tabled curious growth of lemon fruit.

Hawker, July 11.

Present—Messrs. S. Irvine (chair), A. C. Hirsch, F. C. Hirsch, C. W. Pampa, C. E. Harry, J. W. Schuppan, R. Wardle, H. M. Borgas, T. Laidlaw, J. O'Loughlin, G. F. Bales and J. Smith (Hon. Sec.).

FEEDING-DOWN WHEAT.—The Chairman said his wheat crop had benefited from being eaten down by sheep last year, and he thought the forward wheat should be fed down this year. The early wheat had a tendency to run up spindled, but when fed off the plants stood out and became stronger and

hardier. Mr. S. Irvine said every farmer should own a drill, and anyone looking at the drilled crops this season would be convinced that this system of sowing is far superior to that of broadcast sowing. Mr. A. C. Hirsch agreed, and said sheep were better than any other stock for feeding-off, as they do not pull the plants up and they feed more evenly. In August last year a neighbor had a crop running to ear, and permitted him to turn sheep in until the field looked quite bare; but the wheat sprang up again and a good crop was reaped, considering the season. Mr. F. C. Hirsch had favorable results from feeding-off early crops. He had also cut the tops off several wheat plants, and the difference in health and strength of these, as compared with others untouched, was astonishing. Mr. Wardle said the nature of the soil and the variety of wheat must be considered. On some soils early wheats grow too rapidly and need a check, but on other soils they need all the growth they can get.

HOMESTEAD MEETINGS.—Mr. H. M. Borgas invited members to meet at his farm next time, and try to arrive at a decision as to whether early or late sown crops are likely to turn out best. If they would repeat the visit each month until harvest they might be able to judge which are the best wheats for the district, and thus gain the full advantage of the experiment now being conducted. Invitation accepted with thanks.

Penola, July 14.

Present—Messrs. F. A. Stoney (chair), J. T. Morris, T. H. Morris, J. B. Worthington, D. McKay, W. Miller, W. P. Davis, L. W. Peake, E. McBain, Dr. Ockley, R. Fowler (Hon. Sec.).

DAIRY BULLS.—Considerable difference of opinion existed as to advisableness of the department subsidising Branches raising money for purchase of pure-bred stock, some members being of opinion that it would tend to foster a spirit of dependence and kill individual enterprise, while others considered it a step in the right direction for the Government to directly encourage the improvement of stock of all kinds.

FREIGHT ON FERTILISERS.—Mr. Ricketts wished this Branch to co-operate with other Branches in endeavoring to obtain a reduction on freight on fertilisers.

Inkerman, July 10.

Present—Messrs. D. Fraser (chair), J. Sampson, J. Lomman, W. Board, S. Diprose, C. H. Daniel, C. E. Daniel, and W. A. Hewett (Hon. Sec.).

BULLS.—Although members approve of proposal to subsidise amounts raised for purchase by Branches of pure-bred dairy bulls, it does not approve of a similar course with respect to horses, sheep, and swine.

OFFICERS.—Retiring officers were thanked, and Mr. W. A. Hewett was re-elected Hon. Secretary and Mr. W. Board Chairman.

CULTIVATION OF LAND AT INKERMAN.—Mr. C. E. Daniel read a paper on this subject, as follows:—

The most important branch of farm work is how to cultivate our land to make it profitable. A man may be well up in all the other branches of farm work, but if he does not work his land he can never hope to succeed. The time has come when we must either go in for a better system of cultivation or give up farming. The principal causes are the low price of wheat, our lands becoming deficient in plant food or worn out, and last, but most important of all, the meagre rainfall of late years. The low average of our wheat yield in this district for a number of years is due more to want of a better system of cultivation than want of rain. Perhaps the chief reason for this is the scarcity of horse feed; but with the return of good

seasons, or at least better seasons, of this last year or two we have not that excuse. Since the drill has come into use the land on which it has been used has been worked far better than it otherwise would have been, and the drill and manure have had all the praise for the increased returns; but the drill and manure would have been of little benefit without good cultivation. We proved this last year on our own farm, as we got more bags from fallow than we got bushels from grass land, both drilled in the same time with equal quantities of wheat and manure. I am certain that taking an average of four out of five years we would get more wheat from 100 acres of good fallow than from 400 acres of grass land ploughed up and broadcasted. The months of June, July, and August should be our busiest months, whereas we generally speak of these months as slack time; but wherever we may go and we see a first-class farm worked up to date we will find that there is not much slack time about it, but rather all the teams going from almost sunrise to sunset. One of the main points in good cultivation is to do the work at the right time. We often say what a lot of work we put on land and then don't get a good crop, but the fault is that the work is done at the wrong time of the year. Fallowing should all be finished by the end of July or the middle of August, as the more winter rains we get on it the better, and in this dry district it certainly needs two years' rains to grow a crop of wheat. This is where we benefit from fallowing our land, by conserving two years' moisture. Of course there are other ways in which it benefits the land, such as cleaning it, and if our land is all fallowed we can put it all in 'n about six weeks, thus catching the best of the cropping time. As to the depth we should plough, of course it all depends on our land; but I believe in deep ploughing wherever there is any depth of soil. In our scrub lands, however, where we have so much limestone rubble underneath, 2in. or 3in. is ample. After the land is ploughed the shallower we work it the better, more especially in light soils; in fact, on our scrub lands if we could kill all the rubbish with the harrows so much the better, as it is such a difficult matter to get a firm seedbed; whereas if we scarify it or cross plough it we stir the under soil too much. I advise harrowing immediately after rains, even in the summer time. An experienced fruitgrower says that a scarifying between the trees is equal to an inch of rain, and if this true with fruit trees why should it not hold good with regard to preparing land for wheat? When seedtime comes land that is worked on the lines laid down is in good trim for receiving the seed, and can be put in quickly, thus getting a good start and coming away a nice even crop.

Mr. Board thought 3in. was deep enough. Several other members advocated 3in. to 4in. Mr. Lomman would start at 2in. and go a little deeper each year. The sandy soil had been improved by dressing with clay from a tank. Members agreed generally with the paper.

Balaklava, July 14.

Present—Messrs. P. Anderson (chair), J. Crawford, J. Vivian, A. Manley, E. Hams, W. H. Sires, C. L. Reuter, G. Reid, A. Hillebrand, W. H. Thompson, and E. M. Sage (Hon. Sec.).

WOOL-CLASSING.—Mr. Geo. Jeffrey wrote, agreeing to give a lecture on "Wool and Wool-classing" at Balaklava.

DAIRY BULLS.—After some discussion, it was resolved that the suggestion of Central Bureau, re subsidy to Branches purchasing pure-bred dairy bulls, was a good one and worthy of a trial, and if successful the principle might be applied to the purchase of other classes of stock.

Robertstown, July 16.

Present—Messrs. N. Westphalen (chair), A. Day, A. Rohde, H. Farley, W. Armstrong, H. Kotz, J. E. Milde, T. Hagley, S. Carter (Hon. Sec.), and one visitor.

DAIRY BULLS.—Members strongly support suggestion that the department should subsidise amounts raised by Branches for purchase of pure-bred bulls.

CO-OPERATION.—This question was discussed, and it was agreed that co-operation amongst farmers as an organised concern was not likely to be accomplished for a long time. It was remarked that it was not necessary for a farmer to buy back his own wheat, as flour, pollard, &c., at double the price he received, as he could have his own wheat ground at a fixed charge.

STANDARD SAMPLE OF WHEAT.—Members observed that the sample, as fixed for 1899-1900, was much below the sample sent from this district, and it was thought some farmers must have forwarded some of their poorest wheat, which was considered a great mistake. It was resolved that Mr. W. Farley introduce discussion at Congress on fixing a sliding scale in the price of wheat for samples below the standard. [What can the Bureau possibly do in this matter? If the buyer purchases wheat below the standard he will give no more than he thinks it is worth, and no amount of discussion will alter this fact.—GEN. SEC.]

Cherry Gardens, July 12.

Present—Messrs. R. Gibbins (chair), T. Lewis, C. Lewis, A. Broadbent, H. F. Broadbent, G. Hicks, G. Brumby, J. Mackereth, C. Ricks (Hon. Sec.), and one visitor.

DAIRY BULLS.—This Branch supports proposal that the department should subsidise amounts raised by Branches for the purchase of pure-bred bulls of approved dairy breeds.

BRANCH CONFERENCE.—It was decided to arrange for the fifth annual conference of Hills Branches at Cherry Gardens on October 4th.

FARM MANAGEMENT.—The Chairman read a paper on "General Farm Management," which he was asked to read at the Hills Conference.

Golden Grove, July 13.

Present—Messrs. T. G. McPharlin (chair), R. Smith, J. Anderson, R. Coles, W. Mountstephen, J. Woodhead, J. Ross, and A. Harper (Hon. Sec.).

DAIRY BULLS.—Considerable discussion on this subject took place, and it was resolved, by a majority of two votes, that this Branch is not in favor of the Government either loaning bulls or subsidising money raised for the purchase of bulls; but if the principle should be affirmed by a majority of those interested, and is likely to be given effect to, it should also be extended to other domestic animals as well.

Renmark, July 12.

Present—Messrs. W. H. Waters (chair), Capt. Moffatt, F. Cole, R. Kelly, C. Millar, M. Chapman, E. Taylor (Hon. Sec.), and one visitor.

GRUBBING TREES.—A member wished to know best time to grub poplar and tamarisk trees. [When you can find time to do the work effectually.—GEN SEC.]

ALKALINE SOILS.—It was decided to discuss bulletin by Prof. Hilgard at next meeting. Most of the evening was spent in considering the Renmark Loan Bill.

Mundoora, July 13.

Present—Messrs. R. Harris (chair) W. D. Tonkin, W. J. Shearer, J. J. Vanstone, H. Haines, C. H. Button, D. Smith, J. Blake, T. Watt, W. Mitchell, W. Aitchison, T. H. Torr, J. Loveridge, A. E. Gardiner (Hon. Sec.), and one visitor.

EXCURSION TRAINS.—Members approved of suggestion of Stockport Branch that the Railway Department be asked to arrange farmers' excursion trains.

SHEEP ON FARM.—The question of keeping a few sheep on the farm was again discussed. Mr. Torr said he knew from experience that sheep could impoverish the soil quite as much as cultivation if too many were kept; but a few sheep to keep the weeds under and improve the land for ploughing were a decided help to the farmer. The experiences of members of this Branch are in favor of keeping a few sheep on the farm.

TREE-PLANTING.—This subject was discussed, and members were of opinion that it is a very necessary undertaking. As the season promises favorably, the Hon. Secretary was instructed to obtain over 1,300 sugar gums from the Forest Department for the members. Sugar gums are considered most suitable for this locality.

TAKEALL.—Members would be only too pleased to have it proven that Professor Lowrie's opinion, as expressed at June meeting of Central Bureau, that faulty cultivation was the cause of takeall was correct; as if so, the remedy lay in the farmers' hands. Mr. Mitchell advised burning old chaff, &c., on places affected with takeall. The Chairman found it generally effectual to grow oats on land affected by takeall.

Clare, July 13.

Present—Messrs. W. Kelly (chair), J. Christison, R. E. H. Hope, W. S. Birks, and H. J. Yelland (Hon. Sec.).

LECTURES.—Decided to arrange, if possible, for lectures by the Dairy Instructor and Mr. G. Jeffrey, Wool Instructor to School of Mines.

Amyton, July 5.

Present—Messrs. Joseph Gum (chair), Wm. Gum, Thos. Gum, John Gray, H. Turner, R. Brown, Wm. Hawke, Wm. Hughes, and S. Thomas (Hon. Sec.).

ANTS ON PEACH AND MULBERRY TREES.—Inquiry made as to prevention of ants on above trees—[They most probably visit the trees in quest of "honeydew," exuded by peach-aphis and scale insects. Bare the roots of the peach trees at once entirely for 9 in. from the stem, and swab with a decoction made by boiling 3ozs. each of waste tobacco and soap in a gallon of water; then spray the branches with the same decoction, or with resin wash (procurable from city seed shops). Resin wash is effective against scale insects. To destroy the ants, find their nests and sprinkle Paris green around the entrances once a week for a month.—GEN. SEC.]

SEX AT WILL.—A member read a paragraph from a paper upon this subject, but most members were sceptical, and did not think it worthy of consideration.

BORING FENCE POSTS.—A member described this contrivance, consisting of two uprights, with several bore-holes, set on a foot, with an auger fitted with a winch-handle. Other members considered that it would be very useful where the country is level, and with straight posts, but could not be used in rough country, or with crooked posts.

WIRE GATES.—Mr. H. Turner described a simple wire gate for occasional use. It consists of three uprights, with as many fence-wire bars as may be required, affixed thereto. The lower ends of each end upright fit into wire loops affixed to strong posts in the fence, and the tops of the same uprights fit into similar wire loops, except that one end the loop is at the end of a long piece of wire which passes through an auger hole in the post, and this can be drawn tight by means of a lever, to which it is affixed. One end of the lever rests in a slot cut in the post, and the other end is held in place, when tightened, by

means of a wire ring affixed to one of the fence wires. This gate can be made of any reasonable width, and would be useful for hay yards or any place where even as many as eight horses abreast could be taken through.

BUNT.—Members are satisfied that pickling seed with bluestone is effectual when care is used to ensure all grain being thoroughly wetted with a solution of the proper strength. Failure is sometimes caused by neglect of these particulars. Immersion is more sure than any other method, and there is not so much danger of breaking the bunt balls as when turning over with the shovel. Mr. Gray said his brother had broken up some bunt balls and mixed with seed wheat. Some of this he pickled, and the rest he sowed untreated. The pickled grain produced a clean crop, but the other was badly bunted.

Bakara, July 12.

Present—Messrs. R. Barrow (chair), E. A. Hayward, H. R. Hayward, R. Wilson, J. Barrow, J. Roy, A. Hermann, T. Hermann, J. E. A. Seidel, E. J. Deitrich, F. E. H. Martens (Hon. Sec.), and two visitors.

EXHIBITS.—By Mr. Wilson—White Milan turnip, excellent. By Mr. Martens—Early Snowball turnips and White Chinese radishes. By Mr. Hayward—Iridescent eggs of insects on straw.

BULLS.—Members approve of a subsidy of £1 for each £1 raised by subscription for purchase of pure-bred dairy bulls.

FARM STOCK.—Mr. Hayward read a paper on the question, "Which are the most profitable animals to keep on the farm," as follows:—

This depends largely upon circumstances, and may also be considered a matter of opinion. We may exclude the horse, as he is an essential. Although it is wise for every farmer to breed his own horses, yet they can often be purchased cheaper than the cost of rearing them, always excepting the model horse, which at any time commands a high figure. Where the farmer has plenty of feed and water, sheep are undoubtedly the most profitable to keep, bringing in the best returns with the least amount of labor; but, among the scrub, farmers have not sufficient land cleared to keep a flock of sheep. Where there is open country in this locality, unless netted in, the feed will be kept bare by rabbits. The owner is also forced to exercise constant vigilance to protect his flock from the ravages of the dingo. Cows may be considered profitable, but the manufacture of butter and cheese provides a good deal of labor. With eggs at a fair price, fowls are more profitable than cows, as the outlay for fowls' feed and the collecting of eggs is only a trifle. Every farmer will have a certain amount of fowls' feed—screenings and other rubbish—and, of course, the dirtier the farm the more rubbish he will have. Fowls will lay better on clean wheat than mixed rubbish, but it is advisable to give them a change of food at intervals. It will pay better to feed poultry on clean wheat than to sell it at 2s. 3d. per bushel. Pigs may be profitable when they are run in the paddocks and one can find a good market; but, treated upon scientific or practical lines, either cows or fowls will give better results than pigs.

Most of the members consider Durhams (Shorthorns) the most suitable to keep in this district, as they maintain fair condition when others fall off, and, they are suitable as well for the dairy as for the butcher.

Watervale, July 9.

Present—Messrs. L. Buring (chair), H. Scovell, S. Solly, B. Perrin, G. Holder, J. Thomas, and E. Treloar (Hon. Sec.).

EXHIBITS.—By Mr. S. Solly—Flower of date palm (*Phoenix dactylifera*). The tree is over 40 years old and has never borne any fruit. [The date palm is dioecious, requiring the pollen from a male tree to fertilise the flowers of the female tree. The flowers of the female tree are borne on long strings, which may be likened to a "cat-o'-nine-tails."—GEN. SEC.] By Mr. Holder—Splendid sample of Rokewood apple, which is regarded as a good keeper.

BULLS.—Mr. J. M. Richman having during some years past purchased several bulls of the best dairy breeds of cattle, the district has greatly benefited therefrom, and there exists no need for fresh introductions; but members think more attention should be given to size for beef, as cattle about here have greatly degenerated lately.

Mount Gambier, July 14.

Present—Messrs. J. Watson (chair), D. Norman, J. C. Ruwoldt, W. Mitchell, T. H. Williams, G. Bodey, M. C. Wilson, W. Barrows, and F. Lewis (Hon. Sec.).

BULLS.—A lot of discussion took place on this subject. Two offers of Holsteins were considered, but no decision was arrived at.

EXCURSION FARES ON RAILWAYS.—The Enola Branch wrote stating that at Christmas people leaving Adelaide were granted special excursions at very low rates; but country people were never granted such a concession. [When a *special* excursion to Mount Gambier is arranged there are a great number of passengers, enabling the railway authorities to run a train at a profit; but it would not pay to run *special* excursion trains from the South-East to Adelaide unless it could be shown that a great number of people would avail themselves of the privilege. On ordinary excursion days the excursion tickets are granted for either up or down trips at all stations.—GEN. SEC.] It was resolved to ask that special cheap trips may be arranged at the times of the spring and autumn shows in Adelaide.

MILK FEVER.—Mr. Ruwoldt said a farmer had cured a cow affected by milk fever by bleeding and giving medicine. [What medicine?—GEN. SEC.] Mr. Mitchell said he had cured the disease by bleeding, when taken in time. [Mr. Aleck Murray has cured many cows by giving half a bottle of whisky or brandy in a pint of water, and repeat in three hours. With the first dose give 6oz. to 8oz. epsom salts. Two doses of spirit will effect a cure.—GEN. SEC.]

OFFICERS.—Officers for the past year were thanked and re-elected.

EXHIBIT.—Mrs. Williams, of Moorak, sent some apples, supposed to be French Crab, which were in perfect preservation, although gathered fifteen months ago, during April.

GROWTH ON UDDER.—Mr. T. H. Williams showed, under microscope, some growths taken from the udder of a cow, composed principally of Spiroptera worms, liable to cause growths on any part of the body.

Port Germein, July 7.

Present—Messrs. G. Stone (chair), W. Crittenden, W. Head, J. K. Deer, H. Kingcome, W. Broadbear, and A. H. Thomas (Hon. Sec.).

BULLS.—Members agree that it will be advantageous to farmers if Branches can purchase pure-bred dairy bulls with a subsidy from the State.

STANDARD BUSHEL.—Mr. Deer read a paper in which he reiterated the oft-repeated arguments against the present system of fixing the standard of average quality of South Australian wheat each season. The small measures do not give such a fair estimate of the weight of a bushel of grain as would be gained by the use of a larger measure. Farmers should mix their wheat. If there were some of 66lbs. and some of 60lbs., by mixing the average would be 63lbs. Farmers should clean their wheat more thoroughly. Mr. Crittenden said a neighbor had 700 bags of wheat and only five bags of screenings; whereas he had 400 bags of wheat and seventy-five bags of screenings, but he got no better price than his neighbor did.

EXHIBIT.—Mr. Broadbear tabled splendid oranges, which were satisfactory, considering the bad season last year.

Bute, July 10.

Present—Messrs. H. Schroeter (chair), J. H. Barnes, W. H. Sharman, A. Schroeter, D. Green, W. Hamdorf, W. Langsford, M. Stevens, R. C. Commons, E. Ebsary, M. Hall, A. Sharman (Hon. Sec.), and one visitor.

BULLS.—Members are not in favor of the State subsidising any money raised by individual Branches for purchase of pure-bred dairy bulls, because there are several pure bulls already in this district.

LICENSING OF STALLIONS.—Members hope that a law will be passed enforcing veterinary examination and licensing of all stallions kept for hire.

STUMP-CARTING.—After discussion, members decided that the following is the best, safest, and strongest frame for carting stumps:—Take off the side rails of the wagon; place two pieces of 9in. x 3in. timber, one on each side, along the inside of wagon, same length as the body; place one piece of timber 6in. x 4in. and 9ft. 6in. long across each end of the 9in. x 3in.; side rails, 4in. x 2in., 13ft. long, on their edge; then the inside rails same size timber as the outside rail, only on their flat ends, to be built the same as the sides, making the frame to dip in a little, which is much easier to load than the ordinary flat frames. The two pieces of 9in. x 3in. make a good solid bed for the frame, which is not so high, and not such a strain on the wagon, and will carry 6 tons to 8 tons.

Yorkestown, July 14.

Present—Messrs. J. Koth (chair), A. Jung, C. Domaschensz, T. Corlett, J. Latty, H. Hughes, S. Vanstone, G. Bull, T. H. Thomas, and John Davey (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary brought up his annual report. Meetings had not been as numerously attended as they should have been, and the amount of work done and the interest shown by several of the members was much below what should have been expected from them.

OFFICERS.—The office-bearers for past year were thanked and re-elected.

BULLS.—Members were not prepared to consider this matter.

Tatiara, July 7.

Present—Messrs. T. Stanton (chair), T. Hall, D. Makin, E. Prescott, C. H. Wiese, F. Smith, J. Rankine, and W. E. Fisher (Hon. Sec.).

WOOL-CLASSING.—Arrangements to be made for a lecture by Mr. G. Jeffrey, Wool Instructor to School of Mines.

FEEDING HORSES.—Mr. T. Hall read a paper on this subject to the following effect:—

The first point is punctuality in feeding and watering. Feed and water at 5 a.m., and let them roll if they feel inclined; then give them a good cleaning with a whale brush, and set them to work at 7 o'clock. If the team has been thus treated the horses should be well able to work four and a half hours—until half-past 11. Before feeding again give them a little water, and then let them feed until 1 o'clock; give them water, and work them until 5 o'clock or 6 o'clock. Next give them a feed that will last an hour to eat. Meantime get your own supper, and then feed and water them again. At 8 o'clock or 9 o'clock bed and feed them for the night. All this must be done at regular hours and systematically. As to quantity of each feed, this must be found out by careful observation, because some horses require more than others. Never supply more feed than the horse will clean up at each meal, as he never relishes anything left over. Quality of feed must also be considered. Good wheaten hay chaff, not cut too short, so that the horse will chew and not bolt it, is best. If the chaff is good horses will not require much corn in addition to that in the chaff; but bran may be advantageously used to keep the bowels open. Never give medicine until they really need it, but use plenty

of salt. If the haystack is not pickled, give a handful of salt twice a week to each horse, or keep a lump of rock salt in the manger. Straw-thatched roofs to the stables are very much to be preferred to iron. Horses should be kept dry and warm during winter, and cool in summer. If corn is fed it should be either crushed or well soaked.

Mr. Prescott said horses are often over-fed, and this causes indigestion through over-loading the stomach. He had travelled a horse in Western Australia over 400 miles in sixteen days on 30lbs. of chaff per day, without any corn, and the animal improved in condition all the time. Mr. Wiese agreed with Mr. Hall, so did Mr. Rankine, but, as wheat-growing will not allow of men being employed longer than two or three months each year, there was a difficulty in securing consistent and regular treatment of the horses. The Hon. Secretary said he had found that each horse would consume about 20lbs. good wheaten chaff during the night.

Orroroo, July 20.

Present—Messrs. W. S. Lillecrapp (chair), J. Moody, E. Copley, R. Coulter, G. Harding, S. Roberts, W. Robertson, M. Oppermann, W. H. Roberts, and T. H. P. Tapscott (Hon. Sec.).

RABBIT-BREEDING.—Mr. Coulter read a paper to the following effect:—

The rabbit question has closely occupied the attention of every individual and every section of the Australasian population for more than a quarter of a century, with the objects of coping with it as a pest or utilising it in the absence of any remedy. So far as any remedy is concerned, everything tried has been more or less a failure. Diseases introduced amongst them have failed to spread; poisons scattered wholesale over the country have proved effective only for a very short time; and thousands of miles of wire netting have not prevented their inroads on fresh localities. Tens of thousands of pounds have been expended in vain in the effort to destroy them, and the continued cost of the vain effort is a heavy drain upon the pockets of the community. The proposal to breed rabbits has been stigmatised as an emanation from a weak and diseased brain; but it has often happened that sources of great wealth have lain unrecognised close to the hands of everybody until some "faddist" takes up the matter and develops it, to the great advantage of himself and his fellows. Of course, the rabbit is already largely utilised. Its flesh is considerably used as an agreeable and nourishing article of food; its fur is employed in the manufacture of felt hats and many other articles, and its skin is valued for gloves and a number of other uses. During the year ending June 30, 1900, there were 21,065 crates, containing 520,662 rabbits, valued at £13,016, exported from South Australia. [Not a tenth part of the number sent from Victoria or from New Zealand.—GEN. SEC.] The rabbit is one of the cleanest of animals in respect to its food, which cannot be said of poultry. If they could be caught and sent to the freezing works during winter, whilst they are not so rapidly breeding, their flesh would be even of better quality than in spring. Now there are large areas of land which are quite useless for any purpose, but where the rabbits multiply exceedingly, and serve to over-run adjacent valuable properties. The owners do nothing to destroy those rabbits until compelled, and then a considerable expense is incurred annually. If there is any possibility of developing the rabbit and its uses—other than tinning, freezing, and the manufacture of felt hats and gloves from its fur and skin—this otherwise useless land could be turned to profit, as rabbits will flourish where cattle and sheep will starve. The question is, "Can the rabbit, its uses, and its marketing be improved?" At present the animal is a nuisance, and a very costly one. What is required is a more comprehensive method of dealing with it, and thus making its abundant presence beneficial.

Port Broughton, July 9.

Present—Messrs. R. W. Bawden (chair), W. R. Whittaker, W. Tonkin, B. Excell, E. Dalby, G. Pattingale, E. Denniss, and S. M. Bawden (Hon. Sec.).

BULLS.—Members are in favor of Branches purchasing pure-bred dairy bulls with a State subsidy of pound for pound on subscriptions raised.

WOOLSORTING.—Decided to endeavor to form a class to study woolsorting under tuition of Mr. G. Jeffrey

HOMESTEAD MEETING.—This meeting was held at the homestead of the Chairman, who has just recovered from a severe illness.

Burra, June 29.

Present—Messrs. F. A. S. Field (chair), W. Heinrich, J. Flower, J. A. Arnold, J. Scott, W. G. Hawkes, and R. M. Harvey (Hon. Sec.).

BULLS.—It was not considered desirable that this Branch should purchase a pure-bred dairy bull, as the Hon. John Lewis owns a pure-bred Jersey bull which is available for use in this district.

WOOL-CLASSING.—Mr. Geo. Jeffrey gave a lecture on wool-classing, under auspices of the Branch, last month, and it is proposed to form a class under his presidency.

Lyrup, July 10.

Present—Messrs. A. Menzies (chair), D. Thayne, T. R. Brown, P. Brown, J. Sykes, D. J. Trec, A. Pomeroy, W. R. Lewis, W. Healey, T. Nolan, O. Klemm, W. H. Walling, G. A. Bollenhagen, A. Weaver, W. H. Wilson (Hon. Sec.), and six visitors.

BULLS.—Members favor purchase of pure-bred dairy bulls by Branches, with a subsidy from the State; also sires of other classes of stock, on same conditions.

Arthurton, July 12.

Present—Messrs. W. Short (chair), W. H. Hawke, M. Lomman, J. Pearson, J. W. Parker, C. L. Palm, T. Baldock, H. Baldock, J. B. Rowe (Hon. Sec.), and one visitor.

STANDARD BUSHEL.—The Chairman directed attention to an error in *Journal*, page 871, where it stated, as the opinion of the members that "sufficient inducement is given to farmers to properly clean their wheat." The word "not" was omitted, and completely altered the meaning of the sentence. [The error was not due, in this case, to any person on this side of the Gulf St. Vincent.—GEN. SEC.]

MANURES ON FALLOW.—Letter from Prof. Lowrie, in answer to a question, stated that he had had no experience of applying manures whilst laying land up for fallow; but he was of the opinion that bonedust at that time would be beneficial. If he were using superphosphate he would not apply it until he would be sowing the seed.

OFFICERS.—Past officers were thanked. Mr. W. H. Hawke was chosen as Chairman and Mr. J. B. Rowe re-elected Hon. Sec.

Lucindale, July 21.

Present—Messrs. E. Feuerherdt (chair), E. Hall, A. Matheson, G. C. Newman, A. Dow, G. Humphries, B. A. Feuerherdt, A. Carmichael, and four visitors.

BULLS.—Members do not approve of State subsidy for purchase of pure-bred stud stock, but think such matters should be left to private enterprise.

EXCURSION FARES.—Members support contention by Penola Branch that special excursion fares should prevail on all lines of railway during Show week in Adelaide, in September. [Ordinary excursion fees are charged on all lines of railway during Show time in Adelaide.—GEN. SEC.]

PEACH APHIS.—Mr. Feuerherdt said the peach aphis was already mounting from the roots to the branches of the peach trees. [Bare and swab the roots with tobacco and soap decoction, and spray the branches also. Three ounces waste tobacco (or one and a half sticks black tobacco), 3ozs. soap, and 1gall. water, boiled fifteen minutes.—GEN. SEC.]

Finniss, July 2.

Present—Messrs. T. Collett (chair), W. W. Heath, F. Everson, H. Langrehr, F. Dreyer, A. E. Henley, S. Collett (Hon. Sec.), and two visitors.

BULLS.—Members are strongly of the opinion that it is necessary to have a pure-bred dairy bull in the district, and that an effort should be made to raise sufficient by subscription to secure the subsidy of pound for pound to purchase one.

EXCURSIONS FOR FARMERS.—Members would be pleased to have excursions on railways so arranged that farmers may be able to travel and see the country at their slack times. At present the excursions occur at times when they cannot get away from their farms.

FOREST TREES.—It is believed that Kauri trees (*Dammara australis*) will thrive in this locality, as well as in many other parts of the colony, and, as it makes a very valuable timber, an effort will be made to secure a quantity of seed from New Zealand.

KARROO BUSH.—Members would be pleased to have a trial made of a bush, known in Cape Colony as "Karoo," which grows in very dry country, and is eagerly eaten by stock. [I suspect that this is *Pentzia virgata*, of which a bushel or more of seed was distributed by the Central Bureau some years ago. There are some plants still in existence here.—GEN. SEC.]

Port Elliot, July 21.

Present—Messrs. J. McLeod (chair), J. Brown, W. E. Hargreaves, H. Pannell, H. Green, jun., O. B. Hutchinson, C. Gosden, and E. Hill (Hon. Sec.).

EXPERIMENTS WITH SEEDS.—Mr. Brown said that teosinte (*Euchlaena luxurians*) is a valuable fodder plant where it can be irrigated, but does not ripen seeds in this climate. Mr. E. Hill said Iceberg lettuce is very good; also All-head cabbage and White Milan turnip (fit for use nine weeks after sowing the seed). *Tagosaste* (*Cytisus palmensis*), of which several lots are growing here, shows no perceptible difference from the so-called Tree Lucern (*Cytisus proliferus*). The tomatocs sent out last year are useless. Some of the varieties of pumpkins are good, but the growers omitted to record the names. [This neglect is almost universal, and is altogether reprehensible.—GEN. SEC.]

FIELD PEAS.—The best time in this locality for sowing field peas is from the middle till the end of July.

Mount Compass, July 14.

Present—Messrs. R. Cameron (chair), W. Gowing, F. Slater, S. Arthur, A. Sweetman, J. Hutton, F. McKinlay, M. Jacobs, C. S. Hancock, and A. J. Hancock (Hon. Sec.).

BULLS.—Branch favors purchase of stud stock for local use by subscription, with the aid of a subsidy from the State.

SEASONABLE HINTS.—Prepare beds for onions, sow carrots, parsnips, beets, mangolds, tomato seeds in boxes, under shelter. Sow hay crops on swamp lands.

GRUBS.—Reported that grubs, probably some species of cockchafer, are attacking carrots, mangolds, and other root crops. [The remedies suggested are spraying with kerosine emulsion, which flows down the roots and makes them offensive; dig in lime and salt; turn up the soil to frost in winter; use kainit, bisulphide of carbon, gas lime, and some others, but how to apply most of them is not known to me.—GEN. SEC.]

APPLES EXPORTED.—Mr. Hancock has sent the first lot of apples from this locality, through a friend, to England. They were not wrapped, but simply packed in boxes. A letter, dated June 4, stated that the apples arrived in splendid condition. The writer had seen nothing like them since he had left South Australia.

EXPERIMENTS WITH SEEDS.—Mr. Slater had good results from beans and leeks, but kohlrabi was injured by dry weather. Mr. Cameron's tomato seed was a partial failure. Mr. Hancock said Best-of-all beans did not come up to expectations, but Canadian Wonder did much better. Mr. S. Arthur said tomato *Semperfructifera* was small, but of good flavor. Panicum grass did very well, and stood strongly. Mr. Gowling's Brome grass was cut by frost. [It is nonsense reporting upon seeds sent by Central Bureau for trial unless the names of the varieties are given. What information can possibly be gained from a bald statement that "Mr. Slater was very successful with beans and leeks, whilst kohlrabi was rather a failure?"—GEN. SEC.]

ANNUAL REPORT.—The Hon. Secretary reported eleven meetings held since June last year; average attendance, eight. Three meetings were devoted to visiting. Messrs. G. Quinn (Horticultural Instructor) and W. L. Summers (Inspector of Fertilisers) attended one meeting, and gave some valuable information on pruning and on uses of fertilisers. Three papers have been read, and numerous discussions have taken place.

Clarendon, June 9.

Present—Messrs. J. Spencer (chair), J. Chapman, J. Piggott, H. Payne, J. Pilling, W. Spencer, W. Morphett, and A. L. Morphett (Hon. Sec.).

BULLS.—Members support the suggestion that Branches should subscribe half the purchase-money of pure-bred dairy bulls, the other half to be provided by subsidy from the Department of Agriculture.

QUESTION BOX.—"Which is the best way to kill soursops?"—[Do not allow a leaf to remain above ground, and keep at it for three years, or grow smothering crops for three years.—GEN. SEC.] "Why do young apricot trees die down soon after breaking into leaf, and then start to grow below where they were budded?"—[Unless one is well acquainted with all the circumstances, it is difficult to fix a cause. Probably the trees were kept too long before being planted.—GEN. SEC.] "What is the best way to graft orange trees?"—[Bark-graft below ground. It is most usual to bud, however.—GEN. SEC.] "Should peas be sown deep or shallow?"—[In very light friable soil sow 1in. to 2in. deep; in ordinary soils, $\frac{1}{2}$ in.—GEN. SEC.] "Which are the two best early and two best late cherries?"—Early Lyons, Early Purple Guigne; and St. Margaret and Waterloo. "What is the most profitable fruit to grow?"—Late apricots.

Minlaton, July 21.

Present—Messrs. J. D. Mayer (chair), H. Boundy, S. Vanstone, W. Correll, J. Bennett, A. McKenzie, John Anderson, H. Martin, T. Brown, J. Martin, and Jos. Correll (Hon. Sec.).

AGRICULTURAL SCHOOL—Considering that this is the centre of Yorke's Peninsula, and a large farming district, members think that the school should be made the agricultural school for the district.

ALKALINE SOILS.—There are many bare alkaline spots on Yorke's Peninsula. These do not contain a high percentage of sodium chloride (common table salt). Analyses show that there is a rather high percentage of magnesium

oxide (0.34 per cent.) and of sodium oxide (0.35 per cent.). The percentage of phosphoric anhydride is extremely low (0.02 per cent.), and only a trace of potassium oxide is present. Some members thought that gypsum might be of value to counteract the alkalies. Some of the patches that have been sown with wheat and phosphated are doing fairly well. It is hoped that the return of wet seasons will leach out the alkali. Mangolds and beets will grow well on these patches, but it may be necessary in the worst cases to grow them on ridges.

SEED EXPERIMENTS.—Hon. Secretary reported very favorably of the following seeds sent by the Central Bureau:—Medeah wheat, makes extra prime hay; Algerian oats, grown now extensively; Danish Island oats; Royal George piemelon is the best in existence here; Jenny Lind sweetmelon is of delicious flavor. True Tagosaste (*Cytisus palmensis*) made very little progress owing to drought, but up to the present does not appear to differ from the so-called tree lucern (*Cytisus proliferus*). [The true tree lucern is *Medicago arborea*, also called moontrefoil.—GEN. SEC.]

Davenport, July 12.

Present—Messrs. W. J. Trembath (chair), J. E. Lecky, W. Penna, T. McDowell, and J. Roberts (Hon. Sec.).

STOCK COMPLAINTS.—A member inquired as to cause and cure for looseness or scouring in horses. Mr. Lecky inquired meaning of statement that if the tuberculin test were generally adopted doubtful animals could be isolated or disposed of to the best advantage of the owner. [It simply means that the owner of a cow that is suspected to be affected by tuberculosis could isolate her until he ascertained definitely whether she was infected, or could fatten and sell her to the butcher, as if she proved to be only slightly infected, the meat, other than the parts actually diseased, would be fit for human consumption.—GEN. SEC.]

Port Pirie, July 7.

Present—Messrs. P. J. Spain (chair), E. J. Hector, T. Jose, T. Johns, J. Lawrie, F. R. Humphris, G. M. Wright, and R. J. Ferry (Hon. Sec.).

BULL.—Mr. T. Johns reported that the Government bull now in charge of Mr. Lawrie was in excellent condition. The Branch agreed to act as a committee to be responsible for fulfilment of conditions.

WOOL-CLASSING.—Mr. Hector promised to supply fleeces of Lincoln, Crossbred, and Comeback wool for use by Mr. Geo. Jeffrey in teaching the class for wool-sorting.

Pine Forest, June 12.

Present—Messrs. R. Barr, jun. (chair), W. H. Jettner, W. Lewis, J. Phillis, and F. Masters (Hon. Sec.).

FIELD TRIALS.—Judges were nominated for field trial of agricultural implements to be held under auspices of the Northern Yorke's Peninsula Branches at Bute on August 8th.

STANDARD BUSHEL.—Members considered that the report of their latest meeting appearing in the *Journal of Agriculture* tended to show that this Branch was following others in regard to fixing permanent standards, whereas the idea was originally mooted and advocated by their delegate at the latest annual congress.

CARE AND REPAIR OF TOOLS AND IMPLEMENTS.—Mr. J. Phillis read a paper to the following effect:—

A story is told of a workman who constructed a trap so equally proportioned in every part, that nothing went wrong with it until after ages of use it suddenly dropped into dust and iron rust. The man who made it never imparted the secret to anyone else; and nowadays it is necessary to pay constant care to tools and implements in order to get satisfactory work out of them. It is neither a pleasure, nor profitable or safe, to use a rickety plough or machine. When done with for the season, the strippers, binders, mowers, and seed drills should be cleaned, repaired, and put under shelter, and new parts that may be wanted should be purchased. Wagons, drays, and the wheels at least of strippers should have a coat of paint every second year, or oftener. The average farmer with a forge and a few necessary tools can effect the bulk of the repairs needed, and thus save loss of time going to the smith's shop, as well as the cost. There is a point where it is not wise to continue to patch up an old implement; but much may be gained by purchasing an up-to-date substitute for it. He did not advocate running after every new-fangled contrivance; but, when a new implement has been proved to be an improvement in regard to quality and quantity of work it will accomplish, it would not be wise to spend too much time and money on repairs to the old one. Everyone now knows that the paring plough does better work, with less power, than the common stump-jumper with P share of a few years ago. The broadcast seed-sower is giving place to the grain and fertiliser drill; the light, effective, well-made imported scarifier supplants the heavy, cumbersome article of local manufacture. But the bad times of late years have not allowed of farmers securing many of these efficient tools and implements, and there is all the more reason why they should take care to keep those in their possession in their best and most effective condition. A careful ploughman will do much better work with a poor plough than can be made by a careless man with a greatly superior implement. Allowing nuts to shake loose, cotter pins to drop out, and wheels to wobble through neglect to oil axles are some of the principal causes of bad work and short-lived implements. With the greatest care and good management implements will wear out and decay, but their life and efficiency can be greatly prolonged by care and shelter. It is slovenly, foolish, and extravagant to leave implements unrepaired till the week before they are wanted for use, especially if they have to be taken to the blacksmith, because at that time he is rushed by other customers, and cannot devote the necessary time to the work. "The question of housing and painting of iron implements, such as ploughs, harrows, &c., is not, in my opinion, worth discussing, as I consider such practice waste of time and money." Stone walls and iron roofs should be erected for the shelter of such valuable articles as binders, strippers, winnowers, and seed drills, as a fire getting into a straw-roofed shed containing such valuable articles would cost more than to erect a safe structure four or five times over.

Lipson, July 7.

Present—Messrs. J. Brown (chair), J. Wishart, W. F. Darling, H. Brougham, C. Provis, Jas. McCallum, R. Haldane, and E. J. Barraud (Hon. Sec.).

DAIRY BULLS.—Members strongly support suggestion of Central Bureau that the department should subsidise amounts raised by branches for the purchase of pure-bred bulls.

SALT PATCHES.—The Hon. Secretary would be glad if any member could suggest a remedy for salt patches in land. [Will depend entirely on the character. See *July Journal*, page 995.—GEN. SEC.]

Riverton, July 25.

Present—Messrs. H. A. Davis (chair), J. Kelly, D. Kirk, T. Gravestocks, W. Hannaford, M. Nash, H. A. Hussey (Hon. Sec.), and one visitor.

BULLS.—Branch does not favor State subsidy for purchase of stud animals, except, perhaps, with regard to stallions.

FARMERS' EXCURSIONS.—Members consider the present arrangements on railways are sufficient to meet all requirements.

ANNUAL REPORT.—Hon. Secretary reported nine meetings holden during past year, with an average attendance of over six members. There was not the

full complement of members, and there had been several removals and resignations, and one had died. Good work had been done. Two lectures had been given under auspices of the Branch, and many discussions had taken place. There had also been a field trial of a rotary disc-plough.

OFFICERS.—Officers for past year were thanked. The Chairman desired to retire, and Mr. W. Hannaford was elected in his place. Mr. H. A. Hussey was re-elected Hon. Secretary.

Scales Bay, July 14.

Present—Messrs. A. Newbold (chair), G. H. Newbold, R. S. Thomas, C. Nugent, Jas. Roberts, and D. P. Thomas (Hon. Sec.).

WEST COAST MAILS.—It was decided to co-operate with other Branches and public bodies in movement to secure regular communication by sea with Port Adelaide.

DAIRY BULLS.—Members approved of proposal to subsidise money raised by Branches for the purchase of pure-bred bulls, and thought the principle might be extended to other stock.

DISEASED WHEAT.—Mr. Roberts tabled plants of wheat affected by some disease. The plants came up well and appeared strong and healthy until about a month old, when they began to die off. The trouble was most prevalent on new scrub land; the roots were apparently diseased, but good healthy plants were growing in close proximity.

STOCK COMPLAINT.—Mr. G. Newbold reported prevalence of some trouble affecting the eyes of horses. The first symptom was a small spot on the eye near the edge of the retina, which gradually enlarged until it covered the whole eye. The Hon. Secretary had two animals affected during the summer, and at first thought it was due to wound caused by careless driving, but he found a horse running at large affected. Possibly it was caused by injury from cocky chaff or a point of stubble coming in contact with the eye. He advised dressing the wound with olive oil until healed, then cut the cloud with powdered salt. Mr. Roberts had horses similarly affected, and thought the trouble was caused by a wound. Mr. Newbold differed, as it had not previously occurred, while it was very prevalent this year. [This reads like ophthalmia, and not wounds caused by stubble. Bathe the eyes with 20zs. tincture of opium in a pint of water three times daily. For wounds on the eye bathe with warm water and a little sulphate of zinc.—GEN. SEC.]

Pine Forest, July 10.

Present—Messrs. R. Barr (chair), W. H. Jettnr, E. Masters, A. Mudge, and F. Masters (Hon. Sec.).

BULLS.—After a good discussion the following resolution was adopted:—“That this Branch approves of the principle of subsidising bulls by Government, but that its application to other stock be deferred till tried in this connection.”

FARMERS' EXCURSIONS.—Members desire to have excursions arranged for benefit of farmers desirous to see the country. Their only opportunities for slack time are during February and September.

CARE AND REPAIR OF IMPLEMENTS.—In discussing Mr. Barr's paper (read at June meeting) members agreed generally with the writer, and considered the fact that imported implements and machinery completely outclass, in the majority of cases, those of local manufacture, is a grave and serious reflection upon the ingenuity and skill of the mechanics and artisans of this colony.

FALLOW.—Mr. Mudge started a discussion on "Fallow." It is necessary to fallow, and the earlier this is done the better, so as to get the early rains absorbed. All bushes and shoots should be cut and burned. On clay soil plough about 4in. deep; on loose soils with a rubble bottom care must be taken not to turn up the rubble. Sandhills cannot be ploughed too deeply, but in all cases care must be taken to bury all weeds. In early spring cross the furrows with the scarifier or cultivator, and keep harrowed close up to destroy weeds. Sandhills should not be worked thus, as if worked too much the sand is liable to drift. If the fallow is judiciously worked at seed time a heavier yield will result. Mr. Jettner agreed, but would never fallow sandhills unless they were very wet, when they would not drift. The Chairman would not work the fallow. If it were dirty turn sheep on to clean the field. At seed time it is sufficient to drill the seed in, unless the soil is set down. The Hon. Secretary said some farmers could not keep sheep on their small holdings, and would consequently have to clean their fallows with the scarifier. He believed the operation was beneficial if the land was in a moist condition for working. It had been demonstrated that working the fallows after each rain had conserved the moisture in other parts of the colony, and he failed to see why the same should not apply in this locality. It was finally resolved—"That this Branch is of the opinion that fallowing is a necessity to profitable farming in this locality."

Port Lincoln, July 20.

Present—Messrs. W. Laidlaw (chair), J. C. Richardson, W. E. Goode, E. Chapman, R. Puckridge, J. D. Bruce, J. O'Shanahan, Dr. Kinmont, and J. Anderson (Hon. Sec.).

SEASON.—All members are agreed that the present is by far the best season experienced for many years past. Every farmer should now conserve a large quantity of the surplus feed in the form of hay or silage as a reserve.

SHEEP POISONED.—Mr. Goode had two valuable sheep poisoned, and produced a weed which a blackfellow pointed out as the cause. [The weed belongs to the *Helipterum* family, and is not poisonous, though sheep are occasionally killed owing to the accumulation of the "woolly" substance or tomentum in the stomach.—GEN. SEC.]

BEET RUST.—The Hon. Secretary sent leaves of beet badly affected with *Uromyces betæ*, or beet rust. [It is questionable whether any treatment would be effective when the disease is so far advanced as in this case. Spraying with Bordeaux mixture would stop its progress in the earlier stages. It would not be worth while to grow beet or mangolds in the vicinity of this spot for three years to come. The disease will not spread to other plants than those allied to beets.—GEN. SEC.]

Woodside, July 16.

Present—Messrs. R. W. Kleinschmidt (chair), W. Rabach, R. P. Keddie, A. Pfeiffer, F. Heidrich, W. Droegemuller, and G. F. Lauterbach.

ENSILAGE.—Mr. Heidrich quoted from the *American Agriculturist* to the effect that ensilage or any other fermented food does injuriously taint milk, and therefore that paper does not advocate its use for dairy purposes. Mr. Rabach was of opinion that any food containing gases—such as ensilage—is detrimental for dairy purposes, and recommends good hay in preference for milk production. Mr. Droegemuller knew of cases where ensilage had been tried by practical men, and abandoned because of the great labor and waste, and because there was not sufficient increase of milk to warrant the extra expense in making

ensilage. [There are still some people who think the world is flat, and anyone going far enough would tumble over the edge. Agricultural papers print opinions on every side of a subject; but it is hardly possible that the editor of the *American Agriculturist* can have condemned ensilage after having been the first to advocate it, and continuing to advocate it for more than twenty years. There is no doubt that ensilage will taint milk where it is kept in the feed boxes or mangers whilst the cows are being milked, and where the man fails to wash his hands after stirring up the ensilage when about to milk the cows. Dirty habits and carelessness will always cause taints in milk; but whilst many hundreds of thousands of dairymen are using silage for their cows, without the slightest complaint of it affecting the milk or butter, there are only isolated cases to the contrary.—GEN. SEC.]

COPRA CAKE.—Mr. Keddie said he had made very satisfactory experiments with feeding copra cake with chaff. The milk had materially increased in quantity and quality. Mr. Rabach said that richer milk will produce more and better cheese than the poorer, but if the milk is exceptionally rich in butter fats it would conduce to deteriorate the quality of the cheese unless special precautions are taken in the curing and storage.

Swan Reach, July 7.

Present—Messrs. J. L. Baker (chair), P. F. Hasse, D. Rowe, J. Lange, J. L. Harris, L. Fidge, O. Halliger (Hon. Sec.), and one visitor.

BULLS.—Members are in favor of Branches purchasing pure-bred dairy bulls with a State subsidy of pound for pound raised by subscription.

Naracoorte, July 14.

Present—Messrs. S. Schinckel (chair), B. S. Roach, E. C. Bates, G. Wardle, H. Buck, A. Johnstone, and Job Wynes.

BULLS.—After a long discussion it was decided to postpone consideration re bulls until next meeting.

EXPERIMENTS WITH SEEDS.—Mr. Bates reported that bush marrows produced medium-sized fruits, but they were not good; Helios tomatoes produced pear-shaped dessert fruit; cucumbers failed; Hungarian Brome-grass failed in summer, but rye-grass alongside did fairly well; bush beans failed through dry weather and hard water; kohlrabi did fairly well. Mr. Wynes said tomatoes produced fair fruit, and frost killed his watermelons. Other members reported similarly.

GORSE.—Mr. Bates asked if any member knew the uses of the gorse plant. He had seen that in New Zealand they were fattening at the rate of ten sheep to the acre on it. Several members mentioned that it was growing in several places in South Australia, and might become a nuisance if encouraged. It was resolved to ask the General Secretary for information. [If members of our Branches would only read their *Journal of Agriculture* they would not need so often to seek for information. Reference has often been made to the value of "gorse, furze, or whin" as a fodder plant if properly used, and so late as March last, on page 651, there was an article published on the subject.—GEN. SEC.]

TOBACCO TREE.—Mr. Roach called attention to the spread of the tobacco tree (*Nicotiana glauca*). Mr. Wardle said the leaves made a good decoction for spraying trees with. Mr. Johnstone said the Conservator of Forests

recommended it for shelter purposes near Lucindale. [It will become a great pest if not strictly kept within bounds. In many places the tobacco tree has taken possession of large tracts of land. — GEN. SEC.]

STINKWORT.—Mr. Roach reported stinkwort (*Inula graveolens*) to be spreading in the district. Members agreed that this ought to be declared a noxious weed.

EXCURSIONS ON RAILWAYS.—Letters received from Stockport and Penola Branches with respect to excursion trains. Members consider that these are matters for the executive and not the Bureau to deal with.

COMMONAGE FEES.—The Chairman read a paper on the subject of low commonage fees charged by the Naracoorte District Council and the evil results therefrom.

LUCERN.—The Chairman said the best time here to sow lucern is during autumn.

SULLA.—Some excellent sulla (*Onobrychis coronaria*) has been grown at Struan. [This is a most valuable fodder plant, that ought to do well in the South-East. It is also known as *Hedysarum coronarium*, as “Maltese clover.” and “French honeysuckle.” It has a handsome flower, and was distributed years ago by the Central Bureau.—GEN. SEC.]

Maitland, July 7.

Present—Messrs. H. R. Wundersitz (chair), J. Kelly, P. Treasure, A. Jarrett, J. Hill, C. F. G. Heinrich, H. Bowman, W. Wilson, W. Bowey, W. Adams, C. W. Wood (Hon. Sec.), and one visitor.

BULLS.—Members are strongly in favor of Branches purchasing pure-bred dairy bulls with a State subsidy of £1 for £1 raised by subscription.

FARMERS' EXCURSIONS.—Members would be pleased to see arrangements made whereby farmers would be enabled to travel and inspect the country during the only time when they can possibly get away from their farms—during February and September.

HOMESTEAD MEETING.—This meeting was held at the farm of Mr. C. F. G. Heinrich, and the members were greatly pleased and edified with the neatness and compactness of this well ordered and complete homestead. Hospitality was enjoyed and duly acknowledged.

Gawler River, July 6.

Present—Messrs. A. M. Dawkins (chair), J. Badman, D. Humphreys, C. Leak, M. Heaslip, F. Roediger, W. Clark, A. Bray, J. S. McLean, and H. Roediger (Hon. Sec.).

BULLS.—Members approve of the idea that Branches purchasing pure-bred dairy bulls for improvement of the dairy herds of the district should receive a subsidy of £1 for each £1 raised by subscription for the purpose.

FEDING PIGS.—Chairman reported injury to sucking pigs from feeding them with pollard. Members consider that when changing the feed, especially for young pigs, the change should be gradually effected, and then no injury will follow.

OATS FOR HORSES.—Members consider whole oats give better results than when crushed as feed for horses, especially when fed alone. Algerian oats are better than Cape.

SOWING WHEAT.—Members consider that late maturing varieties of wheats should be first sown.

Meningie, June 9.

Present—Messrs. M. Linn (chair), W. J. Botten, J. Williams, W. Tiller, A. J. Myren, H. May, C. J. Shipway, S. F. Robinson, and H. B. Hacket (Hon. Sec.).

EARLY AND LATE SOWING.—Mr. W. Tiller read a paper on this subject. He was convinced that early sowing is best. With late sowing his experience had always shown a partial failure. Early in April last year he sowed a paddock for hay, and in May he ploughed the headlands and sowed with the same kind of wheat. It appeared as healthy as the rest until it came into ear, and then it began to go off, and quite half died. The early sown was a good crop. Late-sown wheat may grow well for a time, but when coming into ear small patches will begin to wither and gradually enlarge as the crops ripen. In this district wheat should not be sown later than May 10, when the plant will get a vigorous growth before the frosty nights set in, and the roots will get a good hold of the subsoil. The late-sown wheat has not strength to enter the subsoil, and when the surface moisture is exhausted in summer the plant dies. Oats should not be sown later than May for the same reason. Barley can be sown in May and June; if sown in April it will have vigorous straw and short heads. The land should be well harrowed. Near the coast in this district barley will mature with very little rain. All late-sown crops should be sown with larger quantities of seed than early sown, as the plants do not stool well. Members agreed that early sowing is best.

"FISHINESS" IN BUTTER.—It was stated that "fishy" flavor in butter is not always caused by uncleanness in dairies, but in many cases may be due to inferior salt, probably gathered from lagoons that are infested with all kinds of decayed organic and vegetable matter.

Meningie, July 28

Present—Messrs. M. Linn (chair), T. W. R. Hiscock, S. F. Robinson, T. Joy, W. J. Botten, A. J. Myren, C. J. Shipway, and H. B. Hacket (Hon. Sec.).

BULLS.—Members approve of the proposal to subsidise £1 for each £1 raised by subscription for the purpose of purchasing pure-bred dairy bulls, and think the principle might well be applied to purchase of other stud animals.

FARMERS' EXCURSIONS.—Members think that better arrangements than at present prevail could be made to afford country people an opportunity to travel by rail on excursion tariffs.

EXPERIMENTS WITH SEEDS.—Members consider that recipients of seeds for experiments ought to report results and also save seeds of useful varieties for further distribution. Mr. Hancock grew some splendid vegetable marrows from Central Bureau seed, but they did not contain any seeds. Saltbushes grew, but something destroyed the plants. Mr. Scott tabled a splendid marrow, 2ft. 6in. long and 18in. average circumference.

REGISTRATION OF STALLIONS.—Members would be pleased to have all entires intended for hire first examined for soundness, &c., by a qualified vet., and then provided with a certificate; but they think the proposed fee too high.

ATTENDANCE.—In future the name of any member will be struck off the roll if he fails to attend three consecutive meetings of the Branch, or to send a sufficient excuse.

WARTS ON COWS' TEATS.—Wanted to know how to get rid of warts on cows' teats. [Tie a piece of sinew or catgut tightly around the neck of the wart, and it will drop off in time.—GEN. SEC.]

Arden Vale, July 16.

Present—Messrs. A. Hanneman (chair), M. Eckert, F. Schuttloffel, A. W. Fricker, L. W. Warren, P. Starr, J. Frances, G. Miller, E. H. Warren (Hon. Sec.), and several visitors.

FIELD TRIAL.—Members regret that no field trial of machinery and implements can take place in this locality this year. The union of importers and adoption of association prices entirely destroys competition in prices, and competitive trials alone can decide the merits of the respective implements, &c. It is recommended that all farmers protect themselves by supporting the Farmers' Co-operative Union.

BULLS.—Members approve of State subsidy of £1 for each £1 raised by Branches for purchase of pure-bred dairy bulls.

OFFICERS.—Past officers were thanked. Messrs E. H. Warren, M. Eckert, and A. Hanneman were elected Chairman, Vice-chairman, and Hon. Sec. respectively.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of June, 1900 : —

Adelaide	1.55	Hoyleton	0.98	Macclesfield	2.08
Hawker	0.57	Balaklava	0.85	Meadows	2.70
Cradock	0.69	Port Wakefield	0.96	Strathalbyn	0.95
Wilson	0.53	Saddleworth	1.23	Callington	0.36
Quorn	1.04	Marrabel	1.27	Langhorne's Bridge..	0.67
Port Germein	0.63	Riverton	1.12	Milang	1.02
Port Pirie	0.56	Tarlee	0.80	Walleroo	0.61
Crystal Brook	1.32	Stockport	0.99	Kadina	0.93
Port Broughton	0.91	Hamley Bridge	0.78	Moonta	1.07
Bute	1.18	Kapunda	0.97	Green's Plains	0.80
Hammond	0.71	Freeling	0.93	Maitland	1.74
Bruce	0.56	Stockwell	1.27	Ardrossan	0.80
Wilmington	1.79	Nuriootpa	1.25	Port Victoria	0.81
Melrose	2.25	Angaston	0.97	Curramulka	1.10
Booleroo Centre	1.27	Tanunda	1.62	Minlaton	1.09
Wirrabara	1.91	Lyndoch	1.26	Stansbury	1.18
Appila	1.08	Mallala	0.88	Warooka	1.07
Iaura	1.91	Roseworthy	0.93	Yorketown	1.10
Caltowie	1.52	Gawler	0.79	Edithburgh	0.91
Jamestown	1.26	Smithfield	0.76	Fowler's Bay	2.07
Gladstone	1.76	Two Wells	0.62	Streaky Bay	2.38
Georgetown	1.66	Virginia	0.92	Port Elliot	2.19
Narridy	1.27	Salisbury	0.89	Port Lincoln	2.33
Redhill	1.17	Teatree Gully	2.09	Cowell	1.19
Koolunga	1.20	Magill	1.95	Queenscliffe	2.11
Carrieton	1.10	Mitcham	2.04	Port Elliot	1.40
Eurelia	1.11	Crafers	3.23	Goolwa	0.85
Orroroo	1.10	Clarendon	2.46	Meningie	0.87
Black Rock	1.12	Morphett Vale	1.83	Kingston	1.92
Johnburgh	1.09	Noarlunga	1.57	Robe	1.98
Petersburg	0.74	Willunga	1.75	Beachport	2.28
Yongala	0.92	Aldinga	1.35	Bordertown	0.79
Terowie	0.81	Normanville	1.35	Wolsley	0.48
Yarowie	0.99	Yankalilla	1.27	Frances	0.78
Hallett	1.53	Eudunda	1.00	Naracoorte	1.38
Mount Bryan	1.16	Truro	1.17	Lucindale	1.83
Burra	0.99	Mount Pleasant	1.27	Penola	1.55
Snowtown	1.24	Blumberg	1.75	Millicent	2.59
Brinkworth	1.22	Gumeracha	1.94	Mount Gambier	1.95
Blyth	1.29	Lobethal	1.88	Wellington	0.61
Clare	2.49	Woodside	1.32	Murray Bridge	0.49
Mintaro Central	1.53	Hahndorf	1.57	Mannum	0.29
Watervale	2.44	Nairne	1.75	Morgan	0.28
Auburn	1.38	Mount Barker	1.75	Overland Corner	0.61
Manoora	1.09	Echunga	1.90	Renmark	0.54

PARTIAL PARALYSIS OF PIGS.

In a bulletin issued by the Ontario Department of Agriculture Messrs. J. H. Reed, V.S., and G. E. Day deal with losses caused by partial paralysis in swine. The symptoms are described as follows:—"The pigs show a disinclination and partial inability to come to the trough at feeding time; the appetite is capricious—sometimes they eat fairly well and at other times scarcely anything; the hind quarters are specially affected, and motion appears to cause more or less pain; symptoms gradually increase in intensity until complete paralysis and loss of appetite occur, death following soon afterwards. Experience indicates that digestive trouble is the root of the complaint, which is usually accompanied by constipation. It occurs amongst well-fed hogs confined in small pens; inaction and liberal feeding cause indigestion, affecting both stomach and intestines; constipation of the bowels follows, and this, through its influence on the nerves, causes partial paralysis. The curative treatment is to produce purgation, reduce the food supply, and give only such as is easily digested. The first can be effected by giving from 2ozs. to 8ozs. Epsom salts, according to size of the animal. It is also good practice to give in addition 10 grains to 20 grains nux vomica three times daily to overcome the paralysis of the muscular coats of the stomach and intestines. Give the nux vomica in the feed if the animals will eat. Epsom salts can be given in skim milk, but unless very thirsty the pigs may not take it in this way. They can be fasted completely for twenty-four hours and then given the salts and milk. This method is better than forcible administration, as the animal is likely to squeal in the latter case, and some of the fluid passing down the windpipe during the squealing reaches the lungs and either causes immediate death or complicates the existing disease with mechanical bronchitis, which would probably prove fatal. In the early stages the complaint can frequently be cured by liberal doses of salt after fasting the affected animals for twenty-four hours.

Preventive and corrective treatment is important. Exercise comes first. Constipation is practically unknown amongst hogs that receive plenty of exercise. The influence of exercise upon the action of the bowels is well known, and when the bowels move regularly there is little fear from paralysis. Feeding is also important, but unless the animals have exercise the skill of the feeder is taxed to the utmost to keep them in good health and condition. Generally speaking the greater the variety of foods the better. Roots such as sugar beets, mangolds, or turnips pulped and mixed with meal rations and moistened with water, milk, or whey give very satisfactory results in feeding tests. Grass is invaluable. Allow the pigs to run on pasture when possible.

Under the name of correctives are included substances which are not foods, but which have a beneficial action upon the digestive organs. Earth is one of the simplest, and a little fresh earth is greatly relished by pigs. Ashes are also good; mixed with a little salt and kept in boxes where the pigs can get them at will, they are very beneficial. The following mixture is recommended by a veteran pig-breeder:—"Take 3bush. common charcoal, 8lbs. salt, 2qts. air-slacked lime, 1bush. wood ashes. Break up the charcoal, mix the whole of the materials thoroughly, and sprinkle the mass with 1½lbs. copperas (sulphate of iron) dissolved in hot water; mix well. Place this in boxes where the pigs can get it when they like.

A complaint somewhat similarly described is reported from different parts of South Australia, and owners of affected animals will do well to follow the suggestions outlined. It is worthy of note that the treatment recommended for partial paralysis in pigs is on the same lines as that advised by our Stock Department for cattle suffering from similar trouble, due to impaction and digestive trouble, caused by innutritious food.

MISCELLANEOUS NOTES.

WEEVILS.—An American farmer says that he found that weevils did not attack maize put up in bags that had contained salt, whilst maize in clean bags in the same lot was almost destroyed by weevils. The experiment repeated gave exactly similar results. Since then, when storing maize in bulk, he dissolves a quart of salt in two gallons of water, sprinkles each layer, and his maize is always free from attack by weevils.

SACCHARATE OF COPPER. A NEW FUNGICIDE.—Professor Prilleux, of the National Agronomic Institute at Paris, recommends strongly the following preparation in place of both the Bordeaux mixture and ammonia-copper liquid, for use as a fungicide or germicide in spraying:—For 25galls. of the spraying liquid slake and make into “milk of lime” 4lbs. of quicklime; dissolve 4lbs. of molasses in a gallon of water, and mix with the milk of lime—this will make a solution of “saccharate of lime”; stir thoroughly, and let stand for a few hours. Next dissolve 4lbs. of bluestone in 8galls. or 10galls. of water, and pour into it the lime-molasses solution, while stirring briskly. The mixture becomes very turbid with the gypsum formed, which may be allowed to settle out, leaving a clear, greenish solution of “saccharate of copper,” which may be drawn off from the sediment, thus obviating all danger of clogging the spray nozzle and leaving the leaves clean; or, if to be used on leafless trees, it may be at once thinned down to the 25galls. wanted, since even thus the liquid is much thinner than the Bordeaux mixture of equal strength.

PLANTS FOR GREEN MANURING.—Experiments have been made at the Californian State Experimental Stations to prove the capabilities of various plants for green manuring. The following table gives the results up to present date:—

Crops, top only.	Pounds to	Pounds per acre of—		
	Acres.	Nitrogen.	Potash.	Phos. Acid.
Grasses	5,000	25	18	10
Alfalfa (?)	6,000	30	20	10
Sugar beets	16,000	57	118	40
Cow peas	9,000	58	40	15
Burr clover	14,000	70	70	18
Red clover	14,000	74	60	18
Lupins	36,000	180	54	36
Hairy vetch	35,000	204	254	66

CONTAGIOUS DISEASES IN GREAT BRITAIN.—The record of the Agricultural Department in the treatment of swine fever during 1899 has been much more satisfactory than hitherto. Whilst in 1898 there were 2,464 outbreaks and 42,700 swine slaughtered as diseased or exposed to infection, in 1899 there were 2,322 outbreaks and only 30,797 slaughtered; in 1896 there were 79,586 slaughtered. Only nine cases of rabies were reported, the muzzling order and the quarantine of foreign dogs having been insisted on; for pleuropneumonia the record is *nil*. Greater activity has been exercised in regard to glanders and farcy, and 851 outbreaks are recorded and 1,665 animals attacked. In anthrax an increase is found which may be attributed to closer supervision, there being 537 outbreaks and 996 animals attacked. Scab in sheep still flourishes, and although the most simple disease to eradicate, 256 fresh outbreaks are recorded in the month of November, 1899, and scab existed in fifty-two counties in Great Britain; consequently are hampered by long quarantine regulations.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY

(C. C. CORNISH, SECRETARY).

Labor Bureau.

Number of persons Registered, and found Employment by Government Departments and Private Employers, from June 25 to July 26.

Trade or Calling.	Number Registered		Number found Employment.
	Central Bureau.	Country Agencies.	
Laborers	133	177	192
Youth laborers.....	16	12	7
Farm hands.....	—	—	1
Stonebreakers	—	—	6
A tendants	5	1	2
Carpenters	26	10	40
Masons and bricklayers	14	2	4
Stonecutters	3	—	8
Ironworkers	2	—	4
Ironplaters	—	—	2
Enginedrivers	4	—	1
Boilermakers	1	1	2
Fitters and improvers....	7	—	7
Boiler peckers and rivet boys	4	—	2
Apprentices	27	—	1
Carriage washers and junior porters.....	40	22	5
Cleaners	28	16	—
Compositors	1	—	4
Gardeners.....	—	—	2
Blacksmiths	—	3	—
Glut cleaners	—	—	10
Totals	311	244	300

July 27, 1900.

A. RICHARDSON, Bureau Clerk.

A Visit to the Broken Hill Proprietary Smelting Works, Port Pirie.

CONTRIBUTED BY INSPECTOR BANNIGAN.

The smelting works are conveniently situated about a quarter of a mile north of the town, and have a frontage to the river of about 900ft. Wharves line the river for the full extent of the company's frontage, and a good depth of water is available for deep-sea vessels at low tide. Ships carrying coke and limestone for the smelters range up to the wharves and deliver their cargo some 80yds. or 100yds inland in the required position by means of flying foxes. Two

of these contrivances are attached to the company's wharves, and are capable of conveying from 300 tons to 350 tons of material each from the ship's hold to the smelters in a working day of ten hours.

The company's works, including slag dumps, cover an area of about forty acres, a good deal of which is reclaimed swamp.

Eleven furnaces of 120 tons capacity, and two of 80 tons, are in blast, and they are capable of putting through 2,000 tons of material in the twenty-four hours. The blast is supplied by eight Green blowers and five Baker blowers. The Green blower is quite a different machine from the ordinary fan, and consists of two sets of iron drums cast in the form of the figure 8. This set of two is enclosed in a strong iron casing, the inner surface of which is shaped to the exact rotary course of the pair of blowers. The movement of the blowers is most interesting. In turning, two of the hollow heads approach each other in a manner that would lead a casual onlooker to believe that nothing could prevent the inevitable crash and a general smash up; but, instead, the empty-headed iron monsters gracefully duck and their heads are allowed to pass through the hollow waist of the fellow blower, and in this way the air is squeezed into the main and forced to its destination in the smelting furnaces.

The blast passes from the blowers into a 7ft. tube, and this connects with the main tube, 4ft. in diameter, which runs the full length of the works behind the furnaces. The blast is distributed to the furnaces by branch tubes and twenty tuyeres to each furnace. The down-takes lead from the upper part of the furnace into the main flue, which is a huge tunnel of about 15ft. x 18ft. running the full length of the smelting house and terminating in the large iron stack 205ft. in height. The base of the stack is of solid masonry measuring about 20ft. x 20ft., and on this is erected the huge iron stack constructed of boiler-plate with a lining of brick. A casual observer would gauge the top to be about from 4ft to 6ft. across, but I am informed that the diameter at the top is just 14ft.

A new pumping plant, consisting of two 20-inch centrifugal pumps capable of lifting 8,000,000 gallons each in twenty-four hours, has lately been added. They deliver the water into six overhead iron tanks holding 33,000 gallons each. Four million gallons of salt water are used daily in the smelter jackets and condensers.

The ore is brought direct from the mine at Broken Hill to the feed floors above the smelters by the railway trucks, which are taken by a shunting engine over a viaduct and deliver their load on the floors without any second handling, at a height of about 22ft. from the surface.

The sulphide concentrates, before going to the smelters, have first to be put through the roasters to get rid of the sulphur, and are then mixed with lime and put through the bricketting machines. These machines are fed with the mixed material, which is pressed into moulds by heavy rollers and delivered on an endless belt in the shape of brickettes $4\frac{1}{2}$ in. in diameter by $2\frac{1}{2}$ in. deep, and weigh about 5lbs. They are conveyed by the belt to the drying shed, where they are stacked for about twenty-four hours, and are then as hard as an ordinary brick. They are then conveyed to the elevators and fed into the furnaces with other ores and fluxes.

The bullion produced from the smelters is next conveyed to the refinery adjoining, where the impurities are removed, gold and silver separated and cast into bars of fine silver and gold ready for shipment.

In the refinery the process of melting the metals is quite different from the method used at the smelters. Here the heat required is not so great, and the bullion is first put through softening furnaces where the copper and antimony are removed. The bullion is then run into desilverising kettles, each of which

is capable of holding 40 tons. Here the gold and silver are removed by means of zinc, and is skimmed off the surface as it cools. The lead remaining is put into a refining furnace and afterwards run into moulds, from which it is turned out in bars ready for shipment.

The silver crust taken off the kettle is, after liquation, in order to separate as much of the mechanically mixed lead as possible, retorted to recover the zinc previously used for desilverising the bullion. This leaves a rich bullion in the retort containing from 4,000ozs. to 5,000ozs. of silver to the ton, which is then conveyed to the cupelling furnaces and cupelled, *i.e.*, the lead is then burned off and the silver, being a noble metal, remains in the cupel. The silver, after being subjected to a further refining operation which brings it to a purity of 99·8, is moulded into blocks and bars of 1,000ozs.

About 1,200 men are constantly employed in the works, and something over £5,000 per fortnight is paid away in wages alone. The men work in three shifts of eight hours each, commencing at eight in the morning, four in the afternoon, and twelve midnight. Every week there is a long shift off, which enables one set of men to enjoy the usual business half-holiday, and this comes to each man's turn once in every three weeks.

The men are to some extent liable to contract lead poisoning, but this is a matter that I have not been able to closely inquire into, and will therefore endeavor to treat the question more fully in a future paper. I may say, however, that it appears to me that a great deal might be done to minimise the danger by enforcing personal cleanliness among the workers at meal times and when leaving the works. Millions of gallons of hot sea water daily flow back into the river, and, if suitable bathing houses were provided, it seems practicable to require each worker to thoroughly wash himself before leaving the works. I noticed men rubbing up tobacco and others eating their crib with soiled hands, and this indicates one of the surest avenues by which the lead may be conveyed into the system.

The wages paid are 7s. 2d. per eight hours for ordinary labor, either on day work or shift work; 8s. 2d. for feeders, tappers, and other leading hands; and 2s. 6d. to 3s. 6d. for boys. Mechanics and tradesmen are paid at the usual outside rates. Shiftmen work seven days per week, daymen six days and sometimes on Sundays. Shiftmen never work overtime.

General View of the English Factories Acts.

CONTRIBUTED BY INSPECTOR BANNIGAN.

(Continued from page 1052.)

The law relating to factories and workshops is to be found in a series of Acts dating from 1878. From the beginning of this century a large number of statutes had been passed on this subject, dealing first (in 1802) with "the preservation of the health and morals of apprentices and others"; then (in 1833) with the regulation of the labor of children and young persons, and afterwards, by degrees, with all the matters which form the subject of the present law. In the year 1878 all these enactments were consolidated in a single statute, which is the foundation of the existing law.

The places to which the Acts apply are either factories or workshops. The general distinction between these two classes of places is, that in the former

machinery is used, worked by steam, water, or other mechanical power; in the latter it is not. But there is a list of nineteen classes of works which are defined to be factories and not workshops, whether mechanical power is used in them or not.

Factories are divided into textile and non-textile factories. The term "textile" applies to factories where mechanical power is used to work machinery employed in preparing, manufacturing, or finishing, or in any process incident to the manufacture of cotton, wool, hair, silk, flax, hemp, jute, tow, china-grass, cocoanut fibre, or other like material. But certain works where these materials are dealt with are specially excepted, and declared not to be textile, namely, print works, bleaching and dyeing works, lace warehouses, paper mills, flax scutch mills, rope works, and hat works.

Under the definition of non-textile factories, there are the nineteen classes of works referred to above, which are factories whether mechanical power is used there or not, and there are also seven other classes of works which are specially defined as being non-textile factories if mechanical power is used there. But the bulk of non-textile factories come under their general definition as premises (other than textile factories) where any articles are made, altered, repaired, ornamented, finished, or adapted for sale by means of manual labor exercised for gain, if mechanical power is used on the premises.

The chief practical differences made in the Acts between textile and non-textile factories relate to the hours of labor of children, young persons, and women, and are to the effect that in non-textile factories the hours on Saturdays are slightly longer, and the intervals for meals on other days are shorter than in textile factories; that overtime employment is allowed in special cases in non-textile factories, but never in textile factories, except in the case of a warehouse forming part of a textile factory; and that the length of time allowed for continuous employment without an interval of half an hour for a meal is five hours in non-textile factories, and four and a half hours in textile factories.

Workshops are defined generally as places, not being factories, where any articles are made, altered, repaired, ornamented, finished, or adapted for sale by means of manual labor exercised for gain. There is a list of seven classes of works which are non-textile factories if mechanical power is used there, but which are defined to be workshops if no mechanical power is used there. But these would all be included under the general definition given above. Workshops generally are subject to the same regulations as non-textile factories with regard to hours of labor. As far as their sanitary condition is concerned, workshops are subject to the control of the local authority, not to that of the factory inspector. In other respects, with slight miscellaneous exceptions, they are on the same footing as factories in general, but, of course, the provisions of the Acts which relate to machinery have no application in workshops.

There are three special classes of workshops which are, for special purposes, distinguished from ordinary workshops. First, domestic workshops (*a*)—that is private houses, places, or rooms where no power is used, and in which the only persons employed are members of the same family dwelling there—are subject to special regulations with regard to hours of labor, and are not subject to the provisions of the Acts which relate to meal times, affixing notices, holidays, accidents, and special rules for dangerous employments. Secondly, workshops conducted on the principle of not employing children or young persons are separately treated in one respect, that the hours of labor allowed for women are different from their hours of labor in ordinary workshops. Thirdly, workshops conducted on the principle of not employing children, young persons, or women are expressly excluded from the operation of the Act of 1878, except so far as that Act refers incidentally to their sanitary condition. As far as

their sanitary condition is concerned, this last class of workshops is in the same position as ordinary workshops, since the Public Health Acts make no distinction between the various classes of workshops.

The whole of the existing regulations for factories and workshops may be roughly divided into two main groups; the first dealing with the state of the premises where the work is done, and of the machinery (if any) on the premises, and designed to protect the health and safety of the workers; and the second, laying down the conditions of employment. The first group, being general in its application, affects all classes of workers, male and female, adult and juvenile alike. The second group, with a few comparatively unimportant exceptions, does not at present apply to male adults, but only to classes consisting of children, young persons, and women. Children may not be employed under the age of 11, and continue to be children, within the meaning of the Acts, till they are 14. Young persons extend from 14 to 18 years of age.

The regulations included in the first group are chiefly concerned with the sanitary conditions of factories and workshops, and the safety of the workpeople. Under the former head are comprised the following subjects, namely:—Cleanliness, freedom from noxious effluvia, cubic space in rooms, ventilation, lavatories, sanitary conveniences, temperature, and humidity of air.

Regulations for safety deal with the condition, the fixing, and the fencing of machinery, with protection against fire, and with the framing of special rules for dangerous employments. Under this head, also, come regulations prescribing the steps to be taken in case of accidents or poisoning occurring in a factory or workshop, the notices which must be given, the reports which must be made, and the inquiries which may take place. Further, there are provisions determining the employer's liability to make compensation to a workman suffering injury in consequence of a breach of the Acts by the employer.

The regulations included in the second group, relating to conditions of employment, determine the limits of hours of labor for children, young persons, and women in various factories and workshops, and the conditions under which overtime employment is lawful, fix the holidays which must be allowed to the same classes of workers, and impose on the employer the duty of seeing that children in his employment duly attend school (unless specially exempted), and that children and young persons under 16 are medically certified to be fit for work before they enter his service.

The number of registered factories and workshops to which the Acts applied in 1894 was 77,708 factories and 92,141 workshops, and the Act of 1895 caused a considerable increase. For the enforcement of the law in these places throughout the United Kingdom factories inspectors are appointed by the Secretary of State, consisting of a chief inspector, six superintending inspectors, and seventy-five inspectors, with twenty-five assistants. All inspectors under the Acts have full powers to enter factories and workshops by day or by night, and any person who delays or obstructs an inspector is liable to punishment. Other officials charged with administrative duties under the Acts are the certifying surgeons, who are appointed for particular districts by the Chief Inspector of Factories, and whose duties are to examine children and young persons with a view to granting to them certificates of fitness for employment, and to investigate and report on accidents occurring in a factory or a workshop. The general administration of the Acts is largely under the control of the Secretary of State for the Home Department, who has extensive powers of determining the limits within which particular provisions of the Acts are to be in operation. In the event of any breaches of any provisions of the Acts, penalties are imposed which may be recovered before courts of summary jurisdiction, and factory inspectors are empowered to take proceedings to recover the penalties.

Seats for Shop Assistants.

The Seats for Shop Assistants Act, which came into operation in England and Scotland this year, is a very short Act indeed, but while this is so, the application of its brief provisions will undoubtedly confer great benefits upon those whom the Act is intended to protect. Section 1 provides that—"In all rooms of a shop or other premises where goods are actually retailed to the public, and where female assistants are employed for the retailing of goods to the public, the employer carrying on such business in such premises shall provide seats behind the counter, or in such other position as may be suitable for the purpose, and such seats shall be in the proportion of not less than one seat to every three female assistants employed in each room."—*Glasgow Sanitary Journal*.



Journal of Agriculture

AND

Industry.

No. 2. REGISTERED AS SEPTEMBER, 1900. [A NEWSPAPER. VOL. IV.

NOTES AND COMMENTS.

The past month has been the most favorable August experienced for very many years. Except in the far northern district, scarcely three consecutive days without showers of rain have been experienced. Everywhere conditions have improved during the past few weeks, and, with the exception of a few districts, the prospects are very encouraging. The month closes with good general rains, and Sir Charles Todd reports that this is the wettest August for thirty-six years. In another part of this issue an interesting comparison shows the rainfall totals for July and August this year and last. From these it will be seen how much more favorable the conditions are this year. September and October weather to a large extent governs the harvest, but with such a store of moisture in the soil we may now look for a good harvest over the greater part of the wheat-growing areas.

Early during the present month Mr. W. J. Venning, of Crystal Brook, called the attention of the Hon. the Treasurer to the fact that the daily papers had stated that the New Zealand Government had received from the Imperial authorities an inquiry for 4,000 tons of hay for South Africa. Mr. Venning suggested that the Treasurer might inquire whether compressed hay or other fodder was likely to be required, which was done, and the following wire received:—"The War Office is prepared for quotations for hay and oats for South Africa." Intending exporters should communicate with the Hon. Minister of Education and Agriculture. With the almost certain promise of a good hay crop, a market in South Africa for our hay would be a great benefit to the growers, and prevent the ruinously low prices that so often follow a large crop here.

The result of the Conference *re* the standard bushel, as reported in another part of this issue, will be disappointing to very many growers. What other result could have been arrived at is difficult to see in face of the emphatic statements of the exporters and buyers that the extra expense which would result from having two standards would be greater than any benefit which would be derived therefrom, and that a very large proportion of South Australian wheat would have to be rejected if the standard were raised. The Chairman of the South Australian Farmers' Co-operative Union stated that they had great difficulty in getting their agents to keep up to the 63lbs.

standard. This certainly places a different aspect on the proposal to raise the standard, though to one who has carefully examined the "fair average quality" samples sent out by the Chamber of Commerce the statement almost seems a reflection on the ability of the growers to produce a reasonably clean sample. The report of the Conference will repay careful perusal, and should be studied closely by all interested.

One question that strikes the inquirer very forcibly in connection with the adoption of 63lbs. as the standard weight per bushel for fair average quality wheat is "how is the weight arrived at?" The Chamber of Commerce, before fixing the standard, sends to the wheatbuyers, millers, the Branches of the Agricultural Bureau, and others for samples of the season's wheat bought *without any deduction*; that is, wheat equal to the previous season's standard, anything lower being rejected. The previous season the standard was 63lbs.; hence no samples weighing less than 63lbs. per bushel would be used in fixing the standard for the current season. Now if samples weighing 63lbs., 64lbs., and 65lbs. per bushel are mixed thoroughly and weighed, how is it possible that the average of the whole can be *only* 63lbs. per bushel? This is a question asked by many farmers, but no explanation has been given, except the statement that no inferior wheat was accepted by the Chamber of Commerce when fixing the standard, but the fact that the standard is no higher than last year appears contradictory.

Under present conditions all action in regard to altering the system of buying wheat seems to come to nought. The buyer says, "If the farmers generally will clean their wheat better, and so enable us to raise the standard, we will only be too pleased." The farmer says, "If I clean my wheat thoroughly I have so many bags of screenings on hand of little value, but my neighbor who leaves this rubbish in his wheat gets paid for it at full market value for wheat, as he receives as much per bushel for his wheat as I do." So long as there is no extra price to be paid for clean wheat weighing above the standard for the season, as fixed by the corn-trade section of the Chamber of Commerce, so long will there be no inducement whatever for farmers to clean their wheat to anything above the average standard of mediocrity. Indeed, as observed by Professor Lowrie, there would be a distinct incentive, if any farmer had a clean sample weighing 65lbs. to reduce it to "standard" by the addition of rubbish. Everyone knows that only 60lbs. are sold as a bushel of wheat, even if a *measured* bushel weighs 66lbs., but all millers will admit that 60lbs. of the latter wheat is of more value than 60lbs. of wheat weighing only 63lbs. per measured bushel. Then why not pay a better price for the better quality of grain?

At the Conference *re* standard sample of wheat Mr. A. E. Davey objected to statements that had been made in the *Journal of Agriculture* on this matter, and in a sense condemned the Editor for allowing them to appear, as, in his opinion, a great injustice had been done by the way in which millers and buyers had been talked about in the *Journal* by farmers. Surely in this matter Mr. Davey was scarcely fair to the Editor. Many statements are judiciously sub-edited, and in some cases not published at all, when they appear unfair. The *Journal* reaches the hands of a good many millers and wheatbuyers, including Mr. Davey, and surely if any injustice were being done it was not too much to

expect those concerned to call attention to the matter. The Editor and the readers of the *Journal* would have been only too pleased to have had both sides of the questions fairly set forth, but apparently no one in the trade appeared to think it worth while to correct what Mr. Davey considered to be unjust statements. It is not often the Editor is censured for publishing too much; the usual complaint is just the opposite.

The recent Field Trial at Bute, in connection with the Northern Yorke's Peninsula Bureau Field Trial Society was a complete failure, owing to all the principal manufacturers and importers refraining from sending any implements. We understand that owing to the enormous expense incurred in sending implements to the many small agricultural shows, the importers and manufacturers formed an association and bound themselves under heavy penalties to refrain from showing at any but three or four of the largest shows. That such action was absolutely necessary in self-protection few will deny, but it certainly seems that a mistake has been made in including in the "black-list" what is practically the only Field Trial Society in South Australia. At the ordinary shows "putty and paint" may go a long way towards winning the prize, but the farmer who requires new or improved implements wants to see them in actual work before he can judge their value. The Bureau Field Trial Society is more than any other a "farmers' society" and appears to us to merit better treatment at the hands of the manufacturers and importers, and we trust that the latter will see their way to supporting any future trials.

The greatest difficulty in the way of dealing with the sparrow pest is the absence of combined action. What seems to be required is for the local governing bodies to arrange for a special week for poisoning the birds. It is useless for one or two taking the matter in hand, as the birds become suspicious and go elsewhere for a time, to return in increased numbers later on. Then again, a grower may succeed in destroying large numbers of the birds, but if his neighbors do nothing he sees no result from his expenditure. To do any good united and thorough action is necessary; half-hearted dealing with the evil is useless. If poisoned grain were distributed during a period of seven to ten days, about August or September, over a large area of country, the destruction of the birds could not fail to be great. If the operation were repeated a few weeks later their numbers would be greatly lessened. Will fruitgrowers please give this matter consideration, and endeavor to get their local authorities to take action in the matter. If we wait until the grass and wheat is ripening and fruit is available we can do but little.

Green maize and pop-corn are very considerably used in the United States of America and in many places on the Continent of Europe; but in South Australia the number of people who use maize in any form (except imported *maizena*) could probably be counted on the fingers of one hand; and even then only a few cobs are used annually about December. This is a great pity, because maize is very nice and very nourishing, and our colonists have not at present any excessive number of vegetable foods to resort to.

A correspondent justly observes that the mere botanical name of any noxious weed is not sufficient to enable a farmer or landowner to identify it should such exist on his property, and he suggests that specimens of all weeds declared to be noxious should be forwarded to municipal corporations and district councils. This would involve the preparation of not less than 180 sets, and to make the thing complete at least 360 glass cases should be furnished for their exhibition. Naturally the institutes would want similar cases, and Branches of the Agricultural Bureau would agitate for sets. But where is the money to come from for payment of collectors of the sets, for manufacturers of the cases, for transport, and for additions as they may occur? Other correspondents advocate similar action in regard to injurious and beneficial insects; others want cases of natural rock phosphates, and so on. All these collections would be interesting, and some might be useful, but each set would be costly, and great complaints could be made of "reckless extravagance and wanton waste of public funds."

To be perfectly strong and healthy, plants require many substances—such as water, nitrogen, phosphoric acid, potash, lime, sulphur, and many others. If any one of these is deficient the strength of the plant and the quantity of its produce or crop are regulated by the deficient substance. Perhaps that substance may be present in the soil, but not in an available (or soluble) form, and in that case it might just as well be absent altogether. Take, for instance, tetracalcic phosphate (basic slag) in coarse lumps, one might put four tons of this upon an acre of land, but no beneficial result would accrue, because it is as insoluble as flint, unless ground to an impalpable powder. Bones and bonedust are slow to give results, unless a lot of the lime is removed by treatment with sulphuric acid, thus making the remaining portion readily soluble in water.

Between August 1, 1898, and July 31, 1899—that is for one year—Austria-Hungary produced 1,041,700 tons of raw sugar from beets. For the season 1899-1900 it is estimated that the product will be 1,100,000 tons—the biggest output that Austria-Hungary has ever known. In Germany, during nine months, from August to April, of the 1899-1900 campaign, 1,554,492 metric tons of beet sugar were produced, as compared with 1,495,804 metric tons during the corresponding period of the previous year. This enormous production is "encouraged" by heavy subsidies from the State funds, as well as by excise duties. The same policy appears to prevail in most, if not all, of the other beet-sugar producing countries, and, although the industry has been thus fostered for many years, it cannot apparently exist without direct State help.

Every child in country districts should be trained with reference to the work and surroundings of its after life. There is absolute necessity that the major portion of our population should be producers, and it is fortunate for those people that rural life is so healthy and so independent in comparison with that of the artisan, clerk, and ordinary laborer. But, in order that our young people may be enabled to take full advantage of their opportunities and privileges, they must devote a lot more of their youth in acquiring a knowledge of matters more intimately connected with their future career than of things likely to be useful only to the non-producers who live in cities and towns. At present the educational system seems to chiefly aim at making our girls fine ladies, school teachers, nurses, and factory assistants; and our boys want to be editors, clerks, men about town, sharebrokers, bookies, railway porters, or policemen.

Some producers lose a good deal through want of care in preparing articles for market. The price given for any produce is fixed by the worst specimen in the lot, and not by average. If clean eggs, dirty eggs, small eggs, and large eggs are mixed in one package, the small, dirty eggs will fix the value of the whole. The milk from the cow with the crumpled horn is no better, perhaps, than that from Old Brindle, and the cream no richer; but if one lot of milk is manipulated for butter by a clean, careful person, whilst the other is worked by a dirty sloven, the prices will differ equally with the quality produced. Sort up the onions and potatoes into lots of equal sizes and appearances, and the prices for each separate grade will be higher than if they were all mixed together. It pays well to be clean, tidy, careful, and methodical.

POULTRY NOTES.

BY D. F. LAURIE.

There is fair inquiry from the country for pure-bred poultry of all sorts. This is a good sign, as there is much room for all-round improvement. One difficulty is in ascertaining the requirements of those who wish to purchase. It is a common practice to write for "a fair bird for breeding, but not a high-priced show specimen." If a decent bird, cheap at the money, is sent, in nine cases out of ten the buyer is dissatisfied, and the seller at length comes to the conclusion that the purchaser really wanted a bird fit to win at a Crystal Palace show for the price of a barn-door fowl. Really people should try to remember that a show bird, a stock bird, and a cull or cast-off are not alike. Very seldom is a show bird of much value in the breeding pen. There is as much in breeding show birds as in any other stock-breeding. Then again, I know of numerous cases where really good birds have been subjected to adverse criticism by people who have not the least knowledge of the breed in question. A gentleman in the country informed me that certain persons in his neighborhood were advocating long legs in Indian Games, and he referred to the plate of the Indian Game cock in my pamphlet, "Hints on Rearing and Breeding Poultry," which is a typical representation. I awarded the special prize for Indian Games at Sydney two years ago to a bird as much like the plate in question as is possible. This bird was admired by everyone at the show. Length of leg is to be guarded against in the Indian Game. An attempt a few years ago was promptly put down with a strong hand by the leading judges throughout the world. Long-legged Indian Games are invariably narrow and short-breasted, and differ altogether in type; the breed never had or should have long legs. One generally hears that on poultry matters no two writers agree. It is worthy of remark, however, that as to breeds for table and laying the opinion, as expressed by the leading English and Australian writers, does not differ. Just at present there are many varieties of poultry occupying public attention, and numerous inquiries are to hand.

As regards Indian Runner ducks there seems to be no end to the good reports; but I must warn breeders not to overdo the thing. We shall one day want new blood, and there must be a good many sales of inbred eggs and stock. As a result the laying powers will decrease; there will be a loss of vitality and size. Nor must the larger breeds be neglected for the egg-laying qualities of the Indian Runner; we must have large ducklings both for the local and the export market.

As regards fowls, inquiries for Wyandottes constantly reach me. We have some fair Silvers, and I notice that several old breeders are taking them up, notably Mr. A. Eldridge, of Norwood, and Mr. S. Cope, of Mount Barker, both well-known Minorca breeders. Mr. Eldridge has had considerable experience

with the breed, and has from time to time expressed his high appreciation of their good qualities. The more good birds our breeders introduce the better the quality of the stock they will have for distribution to our producers generally. Mr. Eldridge has bred numerous splendid crossbred table birds from the Indian Game and Silver Wyandottes. Actual practical experiment sometimes discounts theory. Numbers of Wyandottes that have been pointed out to me at shows were lacking in size, and were not of the correct type. There is a craze for ground color and lacing, both important points in a show bird provided size and type are correct; but to award prizes simply for these points is altogether wrong. The Spanish fowl had all the good qualities bred out of it; the Cochín, as well as the Brahma, descended into a mass of fluff and feathers, all in obedience to the wishes of the "crank" judge. If every judge really knew his business and acted up to his knowledge, they would, one and all, refuse to take any note of exhibits which were not up to standard. Shows are generally supposed to be popular educators in a measure; but judges have been known to appear on duty with "Wright's Poultry Book" or "Vero Shaw on Dogs" under their arm. The task of a judge is a thankless one; even paid judges have so much to put up with, and the honorary judge often encounters fearful language and dire threats from the disappointed exhibitors. I am pleased at all times to give advice in all matters concerning poultry, but cannot include judging. The following are names of good judges, likely to act occasionally:—Messrs. S. Cope, Mount Barker; G. M. Duncan, Twin Street, Adelaide; and W. H. Milford, Stirling West.

Several societies should agree to have poultry shown at one show only. The locality might be changed each year to give each society a turn; then perhaps they could get a first-class man and pay him for his services. The competition and prize money would then be greater, and the stimulus to breed really good poultry on all hands would be increased. No poultry shows should be held later than the first week in September; as a rule the middle of August is late enough. At all shows held from November onwards the classes provided should be for table birds and eggs only. You cannot show good table birds in the winter; and during breeding time, or in the autumn, the birds are not at their best as regards plumage and condition. There are too many country shows; they serve no good. The money devoted to prizes might be concentrated at one point to make a good show; there are lots of good birds in the country. Now, if prospective breeders had a chance of seeing numerous good birds at country shows handled by a competent judge they would know what to breed for whichever purpose they had in view. I would at any time pay twice the price for the parents of a really good show bird than of the show bird itself. Proved breeders are very valuable; the untried show bird may prove a failure.

Hints.

Eggs intended for setting should rest at least twenty-four hours after a journey. Stand them in a shallow box of bran or chaff on the big end. Many failures are due to ignorance of this important fact. It is always advisable to put a distinctive mark on each egg, in ink, before placing under the hen or in an incubator. Keep a book in which to record dates and results; it will always prove of value as a reference, even in after years. Make all nests on the ground; during dry weather pour water on the ground near the nest; the moisture of the earth will reach the eggs and check rapid evaporation of the watery part of the egg, and will also prevent the shell from becoming too hard. Excessive evaporation of the water, one of the constituents of an egg, causes the residue to become thick and sticky; there is insufficient lubricant for the movements of the chick, and, when at length the shell is fractured, the gluey

liquid solidifies, and the chick is fixed to the shell and soon dies. There is far less evaporation in a damp situation than in a dry one; hence the desirability of selecting the ground and keeping the surrounding earth damp. Examine all eggs on the fifth day to see which are fertile; the infertiles can be removed. If several hens are set on the same day, and the percentage of infertiles is high, the fertile eggs can be placed under one or more hens, and a fresh batch be given to the hens from which the eggs were removed. The infertile eggs can be used for cooking. Young poultry require feeding at frequent intervals; they must always be kept growing, so as to be available at the earliest date.

EXPORT OF LOW-GRADE BUTTER.

Last season considerable misapprehension existed as to the action taken by the Department of Agriculture in regard to the export of low-grade butter. Certain interested parties distributed to their customers and others circulars representing that the department was stopping the export of this butter, thus causing serious loss to the producers, who in many cases had nothing else but the proceeds of their cows to depend upon. Such statements were, however, absolutely false; but as the season for the export of butter has commenced, a few remarks on the stand taken by the department and the reasons for same may save some misapprehension on the part of those interested in dairying.

Last season Mr. G. S. Thomson, our Dairy Instructor, found that certain Adelaide firms were purchasing inferior store and dairy butter, milling it and packing it in boxes which they branded with the names of non-existing factories, or as "Factory butter," "Prime dairy butter," and similar misleading descriptions. The attention of the Hon. Minister of Agriculture was directed to this matter by Mr. Thomson, who was strongly of opinion that serious harm would result to our export trade if such action were permitted. The Minister then decided not to allow such brands to be placed on boxes containing this "milled" butter, as it is known in the trade. The question was brought before the Dairy Board, and it was, after very careful consideration, resolved, on the motion of Mr. Sandford, seconded by Mr. Thyer—"That the board heartily supports the department in its efforts to secure the shipment of South Australian butter only under truthful brands and descriptions, and ask the Dairy Instructor to submit to the board for consideration such rules for branding and grading as will ensure shipment of butter creditable to South Australia."

The practice of the Dairy Instructor is to have what are really the first and second grade butters branded "Approved for export," third grade is not branded, but very inferior butter is branded "Pastry." How such action can be said to prevent the export of the butter passes comprehension. The action taken by the New Zealand Department is far more stringent. Every exporting factory or dairy must have a registered brand, and heavy penalties are provided if any package of butter or cheese is allowed to leave the dairy without an appropriate brand, and this brand must correctly indicate the true description of the butter. If it is milled butter it must be plainly stated on the box, and in addition with milled butter all branding must be in red color, while the brands and marks on other packages must be in some dark color other than red. The remarks of the Dairy Commissioner of New Zealand on the subject of grading are significant. He says—"The raising of the standard for creamery butter has not resulted, as some dairymen feared it would, in increasing the percentage of second grade, except to a very limited extent. . . . There is no

doubt the raising of the standard was one of the forces at work which helped to bring about the marked improvement in creamery butter during the past year."

In the *British Australasian* summary of last season's trade there are some significant remarks on the quality of Australasian butter. That journal remarks that complaints of the great quantity of "fishy" butter from Australia formed the dominant note of comment of every dealer consulted about the general quality of the season's butter. A leading buyer stated that a firm that bought 400 to 500 boxes a week wrote him that they had not been buying Australian butter for some time, owing to going off in quality, but they were open to buy large quantities of New Zealand fancy butter. The afore-said journal also states that a very important point noted has been the distinct and marked improvement in quality, quantity, and standing of New Zealand butter.

The following extract is from the official report of the latest meeting of the Dairy Board:—

Mr. Thyer said he was aware that there was much dissatisfaction at the action of the department in this matter, and it was necessary that care should be taken that the shipment of low-grade butter was not prevented. Owing to our local conditions there must always be a lot of second-rate butter produced, and as there was a market in London for such butter it would be suicidal to stop the export. He knew for a fact that unless some alteration was made this butter would be shipped altogether apart from the department. There were many farmers, situated long distances from factories, who had lived during the past few years on the proceeds of their cows, and it was the butter made by such men that was affected. It could not be sold for local consumption, and unless exported the men must starve. Considerable discussion ensued. Mr. Thomson pointed out that much of this butter was last year mixed up again in Adelaide and put in boxes branded "South Australian factory butter," or there were similar false and misleading brands, and it was unfair to the industry that this should be allowed. Mr. Legg thought it was a mistake to prevent the sale of this butter, though they should try to educate the makers up to the production of better butter. Mr. Sandford agreed that the livelihood of a number of people depended upon a market being found for this butter; but he did not see in what way the grading prevented this. The Secretary said there appeared to be some misunderstanding on this matter. In November last the board resolved to support the action taken by the department to prevent the shipment of butter under false or misleading brands, and it was then stated that it was not intended to prevent the export and sale of inferior butter for what it was. Perhaps Mr. Thomson would be able to say whether any departure had been made from the spirit of that resolution. In reply to the chairman, Mr. Thomson said he had not altered the procedure outlined last year. No butter of any description was prevented from being exported. The very inferior butter was branded "Pastry," and the inferior-milled butter was not marked at all; but the department would not allow such butter to be exported through the Produce Depot if branded "Prime factory," "Prime creamery," or in other ways equally false. It was most unfair to the producers of good butter that their reputation should be injured. Mr. Thyer said he could assure members that buyers paid no attention to the Government brands—they tried the butter, and bought accordingly. It was also well known that, with boxes branded "Pastry," or with similar low-grade brands, the agents in London had these brands planed off immediately on arrival. There was no doubt that very great dissatisfaction was felt at the action of the department in putting the brand "Pastry" across the boxes. He wished it to be understood that he was moving in this matter at the request of some of the importers, and not on his own behalf. He would move at next meeting—"That the board was of opinion that the department should abstain from undue interference with the export of low-grade butter." Members agreed that the department should take no action that would prevent the export of this butter; but several failed to understand why, if Mr. Thyer was correct in stating that no attention was paid to Government or other brands upon the boxes, if such brands were planed off before the sale, there should be so strong a feeling on the part of certain exporters.

To most people it will certainly be difficult of understanding why, if, as contended by some, English buyers pay no attention to the brands on the boxes, but buy solely on the quality, there should be any necessity to place misleading brands on the boxes, or why there should be so much feeling shown on the part of the exporters who desire to export this low-grade butter under any brand they choose without interference on the part of the department. Of course the department cannot interfere if the butter is exported through other channels than the Produce Department.

FAULTS IN CHEESE-MAKING.

By J. LEGG, BLAKISTON FACTORY.

At the August meeting of the Dairy Board Mr. Legg read a few notes on cheese-making, dealing principally with common faults on the part of manufacturers.

There are several reasons why cheese, in many instances, is found to be in a faulty condition, the first and most serious one being the presence of whey in the cheese, which causes the article to become mottled and often unfit for human consumption. The presence of such whey is due to insufficient cooking of the curd; the curd, consequently, is not completely freed from whey, and is not sufficiently hard before salting, and no amount of pressure will free an under-cooked cheese from whey.

In mottled cheese whey is always present; I have never known nor seen a good dry curd develop into either a mottled or stinking cheese. Some cheesemakers imagine that when a sufficient quantity of acid is developed in the curd they cannot fail to turn out a good cheese, but my experience has shown this to be not altogether correct. Whilst I admit that the soft, under-cooked curd may make a very palatable cheese if such be eaten when from four to six weeks old, still, if obliged to store such cheese for a much longer period, it will almost certainly be discovered that the longer it is kept the worse it will become. There is always very great risk in making under-cooked cheese, particularly in the colonies. In an ordinary season the bulk of the cheese that is made during the flush of the season has to be kept for some months, and, therefore, needs to be well made to stand the heat of the Australian summer. It is different in colder climates, where the curing room never gets overheated.

Another cause of faulty cheese made at a factory is in consequence of suppliers not exercising sufficient care in their milk supply, for if one can only of bad milk should be included it is sufficient to spoil the whole vat of cheese. Cheese made from sour milk is easily distinguishable from that made from under-cooked curd; the former will be dry and sour, whilst the latter will be soft and soapy.

Some cheesemakers claim that they can make a good cheese from sour milk, but I have not been completely satisfied on this point. No matter how skilled and careful one may be in the making of cheese, it is tolerably certain that each season will witness a certain proportion of second-class cheese. There is always something fresh to learn in the work.

A further reason why cheese is often inferior is that it gets overheated in the curing room. Cheese made on the Cheddar system does not stand the heat as well as that made on the American or loose curd system. In conclusion, there are very few good curing rooms to be found in the colony, as they are in most cases placed on the wrong side of the factory, that is on the north side, where they are subjected to the full effect of the hot wind, and once a cheese gets heated it will never again recover its lost flavor; but cheese will become strong, especially if it has to be kept for any length of time.

GROWING MUSHROOMS.

A mushroom-grower near San Francisco does not follow the exact practice laid down by old authorities, and claims that his new plan is by far the best. His beds are in tiers, one above the other, in sheds; each bed (or box) is 4ft. wide and 21ft. long. The average picking has been 100lbs. mushrooms from each bed. Each bed is about 2ft. deep, and is simply a hotbed, but the surface is 4in. deep of fresh horse and cow manure mixed with a little earth and sand, and in this he places the spawn, chiefly the natural spawn. He

claims to have got mushrooms in six weeks from starting the hotbeds, and these last five months in bearing. All the manure is fresh. Too much moisture kills the spawn, and not enough delays the crop and kills half of it. Wooden buildings are cheaper than brick, and are quite as good for this work if properly built. For market the mushrooms are packed in shallow splint boxes 12in. by 12in. by 3in. deep, which hold about 2lbs. each. A printed guarantee of quality and wholesomeness goes with each basket. The hotbeds are made with new manure. The sides and bottoms of the beds are made of planking, with a space of 2ft. between the bottom and top tiers. The chief point in mushroom growing is the regulation of moisture in the beds.

THE QUALIFICATIONS OF MILITARY REMOUNTS.

The following remarks by the New South Wales Government Veterinary Surgeon (J. D. Stewart, M.R.C.V.S.) on the above subject are taken from the *Agricultural Gazette of New South Wales* for August, 1900 :—

In the selection of horses offered for sale, particular attention is paid to their color, age, soundness, conformation, and action, and I propose dealing with these characteristics separately, so that a better idea of the qualifications of a remount may be more widely known.

Color.

The most acceptable colors for remounts are bay, black, brown, and dark chestnut. Still a good roan is readily purchased.

There is no demand for horses of light colors, owing to their being conspicuous, and thus forming good targets for the sharpshooters of the enemy. Under this category fall white, creamy, dun, piebald, and skewbald horses. Even light chestnuts with considerable white are not liked.

Age.

The ages for horses for active service are strictly limited to between five and ten years inclusive.

Soundness.

Prior to purchase, every horse is submitted to veterinary examination. Needless to state, unsound horses are speedily casted. Chief among the causes of unsoundness are defective vision, malformed mouths, lameness, poll-evil, fistulous withers, broken knees, splints in certain positions where they are likely to interfere with the horse's action, ringbone, sidebone, diseased feet, spavin, curb, stringhalt, and any serious interference with respiration. A blemish that does not materially interfere with the animal's usefulness is not considered a detriment. It is worthy of note that not 2 per cent. of the horses submitted at Wallangarra were casted as being unsound.

Action.

Good clean action is indispensable for army horses. Heavy horses were walked, trotted, and backed, while light horses were tested at the trot, canter, and gallop.

Conformation.

This must necessarily depend on the class the horse submitted belongs to, as, for instance, light cavalry or field artillery. Still, in a general way, it might be stated that the desired conformation consists in the horse possessing an intelligent head, set on a well-formed neck, attached to a well ribbed-up

body of good girth and fair width of chest, supported by muscular limbs carrying good bone and hoof. According to the horse's conformation, together with his height and weight, he is graded to one of the following classes or divisions, particulars of which Major Thompson kindly supplied me with, viz. :—

Heavy Cavalry.—Upstanding horses of good bone and substance, and with exceptionally strong back and loins. They must be from 15·2 to 15·3 high, and be able to carry 17 stone.

Light Cavalry.—Horses similar to the above, but lighter in conformation, yet up to 15 stone. Height, 15 to 15·2.

Mounted Infantry Cobs.—Stout active cobs, with strong back and loins, and powerful shoulders and hind-quarters. They must measure 8 in. below the knee, and be up to 14 stone. Height, about 14·2.

Horse Artillery.—Horses somewhat similar to the heavy cavalry horse, but in conformation more suitable for harness work. They must be equal to any pace. Height 15·2 to 15·3.

Field Artillery.—Active draught horses equal to trotting six miles an hour in team, drawing one ton, and maintaining that pace. They must have weight and substance, good color, deep chests, short legs showing plenty of bone, and good feet. Height 15·2 to 15·3.

Army Service Corps.—Active heavy draught horses about 15·3 high. Occasionally useful horses a trifle higher are taken under this class for special heavy draught work at the port of disembarkation.

Remarks.

Although very few horses were casted as unsound, a fair number were rejected as being unsuitable as regards conformation. The experts never hesitated to reject "weedy," badly ribbed-up horses, or horses whose lightness of bone gave them the appearance of being "tied in" below the knee. Their action in this respect is to be fully endorsed, as it is one which should have a good effect on horse-breeding in the future.

The prices paid for suitable horses were sufficiently remunerative to encourage the more general breeding of animals of the right stamp. No doubt if the average stamp of horse were improved prices would advance accordingly, and breeding would become a lucrative business. A conclusion which forces itself on the mind of every one who has inspected a large number of the remounts recently purchased is that there is no market for the half thoroughbred "weed." This statement is not made with any intention of disparaging the thoroughbred, an animal which commands my full respect, as I believe an ounce of blood is well worth a pound of flesh at the end of a long day's journey, but to point out the fallacy of breeding horses by ill-shaped thoroughbreds out of mares of doubtful origin and objectionable conformation.

Often the only recommendation the sire has is a thoroughbred pedigree, and the fact that he has "won a race." The result of such a cross is usually a "weed" that can gallop a furlong or so, and is of but little use for anything else. The sale of such an animal is not calculated to go far towards paying for the services of the sire, the keep of the mare, and rearing of the progeny. As is well known, a few years back the farmers who kept a few good draught mares could almost clear the rent of the farm by the sale of their young horses, while those that bred good light horses made profitable investments. Certainly the prices that horses brought at that time were fairly high. But although they have been going cheap for the past five years or so, there is every indication of their once more attaining a better value. It must, however, be remembered that when the prices went down the standard of the horses bred correspondingly lowered. A good horse always commanded a good price; and I believe he always will. Moreover, from a breeder's point of view, it is as

easy to rear and feed a good horse as a bad one. With a view of commanding a profitable market for the light and medium-sized horses at home and abroad, the adoption of the following crosses is suggested for the consideration of breeders:—

1. The Suffolk Punch and thoroughbred mare.
2. Hackney stallion and thoroughbred mare.
3. Cleveland Bay and thoroughbred mare.
4. Thoroughbred stallion with mares of above crosses.

The adoption of a tax on stallions has been frequently advocated as a means of improving our horses, and if it could be put into operation no doubt it would have a good effect. In its absence I believe the establishment of a Government stud would offer as equally good an incentive to the more extensive breeding of remount horses.

ORCHARD NOTES FOR SEPTEMBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The planting of citrus trees will be well under way now. It is advisable to settle the soil around the roots by watering the newly-planted trees at once. The grafting of deciduous trees will be completed early in the month. These subjects were dealt with at length in the notes of last month. To these I would refer readers for details. A good grafting wax for this climate may be made by dissolving four parts resin, two parts beeswax, one and a half parts tallow, over a fire. Pulverise the resin prior to adding it gradually to the boiling mixture of wax and tallow. When all is dissolved pour into a bucket of clean water, and with greased hands lift it out and work the substance until it turns creamy white in color. It should then be kept in a greased can or bag. If small stocks are to be grafted take a strip of unbleached calico and fold it evenly in about 1 in. folds, wind it around a stick, and insert into the boiling wax for about ten minutes. It can then be unrolled, torn to desired lengths, and used as required for binding the small sections.

The peach aphid should be controlled by persistent attention in the direction of spraying with tobacco wash. If kept down until hot winds occur this pest usually disappears for the season without doing serious damage. If not subdued at this stage the young shoots just emerging are destroyed, and the rising sap exudes as gum. If the peach trees have not pushed out shoots in late localities the Bordeaux mixture could still be used to prevent curl leaf.

When a few warm days have been experienced rough bark begins to crack away from the stems of apple, pear, and other trees. In those orchards infected by codlin moth a good final scraping should be given, as these insects begin to emerge in the moth form on the plains early in October. It is also a good time to cleanse the interior of fruit houses, to fumigate the interior with sulphur, and whitewash the walls, roof, &c., with good fresh limewash.

Apples stored in heaps will require close attention now, as the rise of temperature will tend to hasten decay.

In the orchard the second ploughing or skim digging will be given in places having a restricted rainfall, but in early localities, the surface will require to be brought to a good tilth at once with the cultivator. Should the weather turn off dry the cultivator should follow close upon the plough in most localities, as the surface hardens wonderfully fast at this period.

The disbudding of newly-planted young trees, and others budded late last season will require careful attention to prevent undesirable shoots usurping the best positions.

The young growth is now beginning to push out upon the citrus trees, and the retention of the fruits much longer upon the orange trees will sap their energies. As soon as the crop is removed, these trees should be carefully pruned.

On old bearing trees rank water shoots should be removed, unless required to fill a vacant space. Dead wood and failing shoots should be cut back to where they emerge from healthy branches. As far as time permits the spray growth which forms the fruit-bearing portion of the tree should be thinned out to admit a free passage of light. Quickly-dissolving manures which tend to stimulate fruit trees should be applied just as the growth is well started. Discretion must, however, be used, or this may be overdone. Sulphate of ammonia or nitrate of soda would supply the necessary stimulus to the foliage and twig growth, while superphosphate should supply stability. The experience of growers in other countries point to several light dressings of these manures during the growing season being more effective than one heavy application. I would suggest that each full-grown citrus tree in good bearing receive a dressing of from 2lbs. to 3lbs. of superphosphate and 1lb. to 2lbs. of nitrate of soda in September and March to coincide with the growing periods of these trees. Deciduous trees should have a single dressing of the nitrogenous fertilizer in September, and the superphosphate a little later on. In any case the above manures had better be applied separately, allowing the nitrate to dissolve and become incorporated into the soil before the superphosphate is applied. Excepting in wet localities, it is rather late to apply barnyard or sheep manure, unless it be in a thoroughly decomposed condition.

NOTES ON VEGETABLE-GROWING FOR SEPTEMBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The increasing warmth of the sun's rays may be expected to make itself felt on all kinds of vegetables now. It is highly desirable that crops upon the plains should be encouraged to make rapid development before the weather sets in very dry. To facilitate aeration of the soil around the roots, to check or destroy weeds, and to avert very rapid evaporation, the surface of the soil between all kinds of crops should be stirred frequently. Light dressings of quickly available manures should be sprinkled—merely dusted—along the rows prior to these operations. In vegetable-growing one should never lose sight of the fact that the value of these crops depends upon maintaining rapidity of growth, which alone produces samples mainly composed of cellular tissue. If permitted to grow slowly, tough fibrous tissues will be formed, and with these the objectionable flavors are developed. The bitterness of the lettuce, or the acidity of the radish or turnip are common examples. Bearing this in mind, it will be readily seen that the manures to apply are those tending to produce sappy growth rather than stability of tissue.

The thinning out of growing crops of turnip, radish, parsnip, carrot, and beet should be carefully practised.

In warm, early localities, well-hardened tomato plants should be set out in the garden; but it will be necessary to shelter these from cold, cutting winds.

Excepting in very early localities it is useless in a cold, wet season such as we are having, to sow summer-growing vegetables outdoor yet. In glass or calico-covered frames fresh sowings should be made of tomatoes, chillies, and eggfruits for successional plantings. Young plants of former sowings should be potted into 4in. pots and grown on in similar frames for some time. It is

not wise to force these plants with manures calculated to promote leaf growth, but rather to keep them stocky and hard. This is best attained by potting them into soil only moderately rich, and after they recover from the potting admit abundance of air to the frames during the fine part of the day.

Apply all water in the mornings and admit plenty of light about the plants.

Cucumbers, marrows, and melons may be sown in pots stood in a frame made warm by the fermentation of fresh manure stacked beneath and around it. Keep the frame darkened until the plants appear through the soil.

Growing crops of cabbage, cauliflower, potato, and pea should be banked up if the stems are long and the wind powerful; the last-named should be efficiently staked.

Stimulating manures can be applied to asparagus and rhubarb beds upon the plains.

Make the usual sowings of cress, radish, and lettuce for salad purposes.

Onions intended for pickling may still be sown thickly on well-prepared soil.

FARM HINTS FOR SEPTEMBER.

BY THE EDITOR.

Upon the weather during this month the success or otherwise of cereal crops will greatly depend. With moderate rains, and absence of close sultry weather the plants will grow strong and healthy, and be free from red rust. If such should appear in any crop it would be well to consider whether it should not be cut at once for hay. In view of the call by the British Government for forage supplies, there is a possibility of remunerative prices ruling for hay during next year; but too much reliance should not be placed upon this theory, as demand may fall off in other directions.

Fallowing should be completed whilst the soil is moist and mellow, so that it will not turn over in a hard, cloddy condition. If ploughed when too dry the clods will not crumble down when rain falls next season; the seed bed will remain in a hollow condition, and consequently the following crop will develop what in England is called "root-fail," or one of the numerous forms of "take-all" of this colony. Where hard-pan exists an endeavor should be made to stir up a couple of inches, but do not turn the subsoil on to the surface if it can be avoided.

Wherever there is a deep, friable alluvium it may be possible to grow some lucern, and an attempt should be made, because there is no plant known that will give more and better green fodder for farm live stock. Where cows are kept it is necessary so have a good supply of green fodder for autumn and early winter feeding, and lucern will give the greatest satisfaction if it can be grown. The young plant is subject to injury from night frost, but the older plants will withstand a moderate amount of frost. It is well, therefore, to get the seed in when the night frosts are no longer to be expected, and before the heat and dry weather come on—say about this month. Make the seed bed as fine and as level as possible—"like an onion bed"—and drill in the seed in rows 1ft. apart, using 10lbs. to 12lbs. seed. Roll lightly at once, and when the plants are up use the horse-hoe to loosen the soil and destroy weeds. The seed should not be covered more than $\frac{1}{2}$ in deep.

In some places, where not too hot and dry, seeds of kohlrabi and swede turnips may be sown on rich soil in drills 2ft. apart. When the plants are up thin them out to 10in. apart, keep them well hoed, and destroy all weeds. These are good for kitchen purposes, as well as for feeding farm stock.

Dwarf Essex rape is by far the best variety for fodder. The land should be

rich, thoroughly well prepared, and drilled with 3lbs. of seed per acre, in rows 18in. to 24in. apart. This crop should be well hoed until the plants cover the ground.

Mustard will mature seed within eleven weeks after sowing. It is a useful crop in conjunction with others for feeding sheep and other stock. White mustard is usually sown for this purpose, in drills from 18in. to 3ft. apart, according to strength and richness of the soil. Ten pounds of seed is enough to drill on an acre. If grown for seed the drills should be 3ft. apart, and less seed sown.

Chicory is a small farmer's crop and can best be grown in the South-East. There is a limited sale for the roots in the city, and in some seasons a fair quantity comes over from Victoria. Deep chocolate loamy soil is best if damp and well worked to a good depth. Any manure used should be well rotted and mixed with the soil. Three pounds of seed will suffice for an acre, and should be sown in drills 20in. apart; plants thinned to 9in. directly they are up. The seed ought to have been from selected extra large roots. Very frequent hoeing is necessary to keep the soil open and to destroy weeds. When the crop is ready for harvesting every particle of root must be taken out, else those left will grow. The roots must be well washed before being marketed, and the largest should be saved and replanted for seed production.

It is most advantageous to sow all summer fodder crops in drills, because they cannot thrive unless they are frequently hoed to let in air as well as to destroy weeds. The surface must not be caked or cloddy, but kept to a fine loose tilth. If this is more necessary for one class of crop than for another, the preference would apply to root crops.

Ensilage has been so often recommended by those who regularly use it, as well as by agricultural writers who have travelled much amongst dairy and other farms and have seen its advantages, that it is not necessary to say more than to remark that every provident farmer and dairyman should put down enough this season to last for at least one year. It is a good plan to build up temporarily with planks on the sides, so that the pit can be filled up to allow for shrinkage.

During this month the following crops may be sown:—Dhurra, Kaffir corn (red and white), holcus, sorghums of all other sorts, maize, millets of all kinds (including *Andropogons*, *Panicums*, *Setarias*, &c.), Bokhara clover, chicory, buckwheat, pumpkins, melons, squashes, beet, mangolds, *Poa* grasses, lucern, pearl millet (*Penicillaria spicata*), sunflowers, tagosaste, Italian and other rye grasses, &c.

Dhurra, maize, sorghum, &c., should always be sown in drills about 3ft. apart with 1ft. between the plants. Hoe frequently, but never deeply, else the roots will be injured whilst the crops are growing.

Pumpkins should be protected from the wind turning the vines over, as any twisting or bending will injure the sap cells. It is a good plan to sow maize amongst these plants for that purpose. If this is not done, drive in long pegs or stakes, and never lift or handle the runners or vines. Do not dig between the plants within the area that could be reached by the runners. Pie melons and other plants of this class require similar treatment. They all need a lot of room to grow in.

In the South-East peas may be sown now. It would probably pay to grow culinary peas for sale as seed. Sow also various clovers, trefoils, cocksfoot grass, fescues, rye grass, poas, and Hungarian grass.

Everything should be ready for hay harvest. The rick-yard should be cleaned up, foundations put down, fences repaired. The mowers, stringbinders, hay-frames, hoes, and other tools and appliances should be in perfect order.

LUCERN.

Lucern (*Medicago sativa*) has been cultivated for centuries. In cool, moist climates its roots run from 3ft. to 4ft. deep; but from long cultivation in arid climates the plant has developed the habit of sending its roots to depths of 20ft. to 30ft. for water. For this reason it is desirable to procure seed from countries where dry climate and high temperature prevails. In Europe the lucern lives about twelve years; in Spain and other hot, dry climates it lives fifty years or longer. It is necessary to start the young plant at a time when it is not liable to be subjected to night frosts; but when the roots have taken a strong hold of the soil lucern will withstand a moderate amount of hoar frost. At first the growth of lucern is rather slow, but when the roots have become strong and well developed the plant grows very rapidly and luxuriantly. As this is the case, it is necessary to plough the land deeply and to pulverise it thoroughly—in fact, it cannot be too well prepared. Subsoil ploughing should be resorted to in most cases—the exception being deep, rich sandy alluvium. Heavy clay soils are seldom suitable for this plant; but these may be modified by good heavy dressings with quick lime. The surface should be levelled and worked down to a very fine tilth. The seed should be sown by drill if possible, $\frac{1}{2}$ in. deep, in drills 9 in. to 12 in. apart. Roll lightly at once after sowing, and as soon as possible after the plants are up commence to cultivate between the rows. Weeds must be kept down, and if the surface is kept well pulverised the crop will grow rapidly. There should be no furrows on a lucern paddock; but the field should be level all over. Eight pounds of good seed is quite enough to drill on an acre; but if broadcasted, any quantity up to 20 lbs. may be required, according to the skill of the sower. It is not desirable that stock should be allowed to graze on lucern; but, at any rate, if animals are turned on to the fields they should be kept moving, and not allowed to eat the plants down to the crown. As this is a section of the leguminosæ, no nitrogenous manures will be required after the crop has become well established, but phosphatic and potassic fertilisers will prove highly beneficial. Lucern is apt to cause bloat or hoven, especially when animals are turned upon it when very hungry, or after having been fed for a time upon dry food. In such cases a large tablespoonful of carbonate of soda dissolved in $1\frac{1}{2}$ pints of water and administered to the affected animal will give immediate relief. For milking cows, lucern should never be given until it has been cut and left to wilt for several hours. There is enormous waste of fodder by allowing stock to graze upon it. They tread down a lot, and they spoil more by evacuations and by lying down on the green stuff. It has been shown by experiment that three animals may be kept on the produce of one acre by cutting and feeding in racks where only one could live by grazing on the field.

THE WATER HYACINTH AND OTHERS.

Mr. Leslie G. Corrie, President of the Queensland Acclimatisation Society, and one of Queensland's most zealous progressionists, at a recent conference of farmers at Warwick denounced the introduction of certain plants (and he might have added certain injurious insects, birds, quadrupeds, and other animals) as a crime. Mr. F. M. Bailey, F.L.S., Queensland Government Botanist, directs attention to a yellow water lily (*Nymphæa flava*), as being more dangerous in navigable waters, creeks, channels, &c., than the Water hyacinth (*Pontadeira crassipes*), on account of its strong rootstalks and excessive reproductive powers. This plant has been introduced to numerous ponds and creeks in Queensland on account of the beauty of its flowers, and is already

causing serious apprehensions. But the Water hyacinth has taken possession of large areas of water in Queensland, and is exciting well-founded apprehensions. As often before stated, this beautiful pest has stopped the navigability of several rivers and lakes in Florida; and the Queensland *Agricultural Journal* states that inquiries have proved that there are few districts in that colony where it has not taken hold. It exists in the Bremer and Upper Brisbane rivers and a number of creeks and water areas. The peculiarity of this plant consists in its floating on the surface, and being carried in great masses, killing all other water plants and completely choking all navigation. Were this pest to extend to the Murray river and its tributaries it would be most disastrous. Every billabong would be covered with it; every creek, lake, and quiet bend would assume the appearance of a meadow, and no boat, barge, or steamer would be able to make its way across the waters which before were navigable. The fresh water lakes near the Murray mouth would be choked up, and only those portions affected by the salt water tides would be clear and open. That there is a possibility of such a disaster occurring is evidenced by its presence on some of the tributaries of our only river has been discovered in parts of New South Wales; but efforts are being made by the authorities to exterminate the weed in these localities.

THE SOUTH AUSTRALIAN FARMERS' CO-OPERATIVE UNION.

Thursday, September 13, will be a history-making day for the members of the above institution, as on the evening of that day the commodious new premises erected for the Union in Adelaide will be opened. The building occupies the corner of Bentham and Franklin streets, and is close to the General Post Office. It covers a space of 70ft. x 60ft., and the cost is to be met by the issue of new shares taken up by the members for the special purpose. The interest on the cost of land and buildings will not represent more than at present paid for office accommodation. The year just closed has been very successful, and the directors' report, as under, is worthy of close study, particularly by those interested in co-operation:—

Your directors are pleased to be able to place before you such a favorable balance-sheet.

The turnover during the twelve months has been so great that, even though the profit on any particular line has not been large, the total profit, viz., £3,820 14s. 5d. is very satisfactory, showing as it does a profit of 26½ per cent. on the paid-up capital, but only 1½ per cent. on the turnover of £278,111 3s. 3d. The directors have decided to write 10 per cent. off plant, 5 per cent. off freehold, doubtful debts £150. and to place a further sum of £150 to the reserve fund. Total, £940 1s. 6d., leaving a net profit for the year of £2,880 12s. 11d.

The feature of the year's working is the large amount of business done with such a small working capital; this could not have been done with a credit business. No doubt it appeared hard to some of the shareholders that the directors should press for cash payments, but it was absolutely necessary. Your directors wish to draw the special attention of the shareholders to the fact that the business has been so managed that all through the year the Union has been prepared to deal with shareholders' wheat, and pay equivalent to full English values at all the agencies, and if shareholders were not satisfied they had the option of shipping their wheat and obtaining an advance of 75 per cent. The wheat business has increased to such an extent that the directors (to encourage shipping) were able to reduce their charge for shipping to ½d. per bushel.

New agencies have been opened at Naracoorte, Wolseley, Mintaro, Farrell's Flat, Hamley Bridge, and Owen.

The number of shareholders has increased from 2,580 to 2,948, and the shares taken from 20,057 to 23,999, being an increase of 368 in the number of shareholders, and of 3,942 in the number of shares.

The business done has increased to a greater extent, and has been most satisfactory to the directors, more particularly as the increase has been greatest in the old agencies, where the shareholders have become used to the system of doing the business.

In wheat, including 80,447 bags brought forward from last year, 477,525 bags have been received; of this large quantity 106,883 bags have been shipped, 242,808 bags have been sold, and 138,903 bags stored, 11,000 bags of which are included in the shipment, and carried forward to this year.

In oats, barley, and potatoes 16,873 bags have been disposed of. The potato business has improved since the new agent has been appointed at Mount Gambier, and in future the union should do a good business between shareholders in the South and North.

Notwithstanding the decrease in the number of sheep in the colony, the wool and skin business again shows an increase. The total amount dealt with for shareholders has been, on wool, £39,663 16s. 3d.; on skins, hides, etc., £3,733 5s.

The total payments for the twelve months have been £278,111 3s. 3d., or an increase over last year of £106,428 7s. 4d. Notwithstanding this large turnover there have been hardly any losses.

The money required for the purchase of cornsacks and manures was £27,000.

The directors have to report that, as authorised at the delegates' meeting held in March, they purchased land in Adelaide for erecting new offices, which offices have now been completed at a cost of £3,500, but so far very few of the shares which the delegates promised would be taken to meet the cost have been applied for.

CATERPILLAR PLAGUES.

Reports from Colton and Scales Bay state that caterpillars of two sorts are doing great damage to grass and to wheat crops in those localities. In New South Wales during July similar complaints were recorded from the southern districts. Periodically, in the South-East of South Australia, we are afflicted by the presence of myriads of caterpillars, which utterly destroy barley and oat crops, and considerably damage wheat crops and grass paddocks. Very little effort seems to have been put forth by the residents in any locality to cope with the plagues, but many methods have been suggested.

The caterpillars travel in armies, and clear off grass and crops in their march. To-day they may be within a couple of chains of a fine crop of oats or barley where there is not a caterpillar to be seen, and to-morrow a margin of several chains width of that crop will not have an ear of barley or a bell of the oat (as the case may be) left standing. The caterpillars just gnaw through the top "joint" of the barley straw, or the "strig" or ligule of the oat, and the ear or oat drops to the ground amongst the untouched straw, or, if wheat be in the way, the caterpillars just clean off the leaves or flag, and leave the straw and ear standing. During the day the road between the infested paddock and the clean one will be crowded with caterpillars, all marching on to the crop, and within a few days they will have gone clean through a sixty-acre field, and have begun an attack on a third crop. In a very few cases an energetic farmer has run rollers up and down the road between his own and his neighbor's crops, and thus has exterminated great numbers, without, however,

saving much. Others have mown their oats and barley, but the pests have attacked it, even in the shocks, and have done as much damage as would have occurred had the crop been left standing. It has been recommended to use harrows interlaced with bushes, leaving the ends projecting, and to drag these back and forth along the roads whilst the caterpillars are crossing, or upon the grass paddocks when these are affected, and it appears to be reasonable to hope for good results. Another promising remedy is to make trenches across their line of march with perpendicular walls 9in. deep. At short intervals in those trenches dig out pits. The caterpillars would fall into the trenches, fail to climb the walls, and then travel on to the nearest pit, where they fall in, and remain for a time trying to climb the crumbling walls. A man or a boy can then crush the collected pests with a rammer, or by trampling on them. Another plan is suggested, to make a plough furrow, with the land side next to the crop to be protected, and scatter pellets of poisoned bran or pollard along the furrow. To make the poisoned bait, mix 8ozs. of arsenic, 8ozs. common washing soda, and 4lbs. brown sugar in 1gall. boiling water, stir until all is dissolved, then mix this with 30lbs. of bran, or 20lbs. bran and 10lbs. pollard into a stiff paste with enough added water, then break into pieces the size of a marble, and scatter along the trench.

PRUNE-CURING IN FRANCE.

The petite prune d' Agen is the true prune. The fruit is allowed to fall from the trees (as stated by a Frenchman in the *Californian Fruitgrower*); but the last of the crop has to be gathered by hand, and is used for a second quality. The prunes are laid on trays in the sun for a day or two, and then subjected to heat in a dryer three times in succession. The first two operations gradually dry the fruit, the last finishes the work and puts on the gloss. Each exposure to heat lasts about six hours. The first "cooking" is at a temperature not higher than 122° F. nor lower than 113°. After each cooking the prunes are simply rolled over in the trays, but never touched with the hands. When cold they are returned to the evaporators or ovens. If the heat is allowed to rise too high the fruit will burn and be injured. In the second cooking the heat must not rise above 160° nor go below 140°. The third cooking is done at a temperature between 174° and 194°, but sometimes up to 212°. This last one requires even more watching than the two first, as the least excess of heat may puff the prunes and burn them. The curing is finished when the fruit presents a fine and glossy skin, and when the flesh feels plastic. But it must be seen to that the kernel is cooked, else this will go mouldy and spoil the fruit. The prunes are next stored in bins. If at any time they begin to show signs of moisture on the skin, they must at once be returned to the dryer. Prunes are very liable to attract moisture from the air.

HORTICULTURAL NOTES.

FERTILISERS FOR FRUIT TREES. --A good standard formula for a fertiliser for fruit trees, according to a prominent American authority, is 5cwt. to 10cwt. per acre of a mixture of equal parts of bonedust, superphosphate, and muriate of potash. Another formula is three parts bonedust to two parts muriate of potash. These would need to be varied according to the nature of soil, trees, and previous treatment. When trees show that nitrogen is deficient (absence of vigor and color in the leaf will indicate this), from 1cwt. to 1½cwt. nitrate of soda may be applied. Nitrogen may be supplied by growing and ploughing under leguminous plants. It has been proved beyond doubt that properly fertilised trees will stand adverse seasons better than trees not fertilised.

POISONED HAITS FOR CATERPILLARS AND BEETLES.—A few years since Mr. A. B. Robin, of Nuriootpa, reported that he had found a mixture of bran, sugar, and Paris green most effectual in destroying the night-feeding caterpillars, which at that time were playing havoc with the vines. Mr. Robin's discovery was quickly availed of by other growers with equally satisfactory results, and its value as a destroyer of gnawing insects of various species has been abundantly proved. Mr. Petersen, of Upper Sturt, a very large grower of strawberries, reports this mixture to be the only thing he found effectual in destroying the small beetles which do so much injury to strawberry plants, and last year he used several pounds of Paris green in this way. The poisoned bait is prepared by mixing 8ozs. Paris green, 4lbs. molasses, or honey, or sugar, and 30lbs. bran with enough water to make a stiff paste. This paste is broken into small pellets and distributed near the plants attacked.

THE BENEFITS OF SPRAYING.—The benefits resulting from the spraying of fruit trees with Bordeaux mixture may be summed up as follows:—(1) The trees have a healthier appearance, (2) fruit and foliage are more or less free from fungus diseases, (3) lichens and mosses are destroyed, (4) the fruit will command a better price owing to improved quality. If properly treated with Bordeaux mixture the loss of fruit from the various diseases, known commonly as "scab," are reduced to a minimum.

POISON FOR GNAWING INSECTS.—A new and cheap effective spray compound for codlin moth and all kinds of mandibulate (or gnawing) insects can be made as follows:—Boil 1lb. white arsenic with 2lbs. of freshly slacked lime in 2galls. of water for forty minutes, stirring same frequently. This makes a "stock" mixture. Use 3 pints of this with 50galls. of Bordeaux mixture, or, if water only is used, add 2lbs. of freshly-slacked lime to the 3 pints of stock, stir well, and then mix it thoroughly with 40galls. of water. A good deal more slacked lime will be taken up by either mixture if 3lbs. or 4lbs. of sugar is added. Lime counteracts any injurious effects that might follow the presence of free arsenic in either of the compounds.

GRAFTING WAX.—As the grafting season is coming on, the following recipe will be found suitable for a grafting wax:—Take 4ozs. resin, 2ozs. beeswax, and 1½ozs. tallow. Melt the beeswax first in a vessel over the fire, then add the tallow and stir well from first putting on the beeswax. Pulverise the resin, and when the beeswax and tallow are well incorporated, add the powdered resin *very* gradually, still stirring all the time, and when well mixed and quite dissolved, pour the whole into cold water; grease your hands well, and take out the wax and work and roll it until it turns pale green color, almost white, and then put it into a well-greased tin until wanted.

THE VERMONT DAMSON.—It is stated that this plum was raised in Tasmania by a colonist whose property was known as "Vermont Farm." From thence it was introduced to South Australia, so long ago as 1839, by the late Henry North Edsall, who conducted a nursery and fruit garden in Norwood up till about 1867. It is suggested that as the name "Vermont" improperly savors of American origin the plum might be named "Christmas," because it is usually ripe by Christmas Day.

TO MAKE CANDIED PEEL.—To make candied peel choose sound, fresh lemons or citrons, and cut them into quarters, lengthwise. Remove all the pulp, and soak the rind in salt water for three days, and afterwards in cold water for a day. Next boil it in fresh water until it becomes tender; then drain the rind, and cover it with syrup made with 1lb. of sugar to a quart of water. The rind will begin to look clear in about thirty minutes, when it must be again drained. Then make a thick syrup, allowing 1lb. of sugar to a pint of water. Boil the rind in this over a slow fire until the syrup candies. Then take out the rind, drain it, and dry in a cool oven,

POISONS FOR SMALL BIRDS.

STRYCHNINE.—(a) 1oz. strychnine, 1oz. spirits of salts, 1lb. sugar, 60lbs. wheat, 4galls. boiling water. Dissolve the strychnine in spirits of salts, then add the solution and sugar to the boiling water, stirring well. Pour in the grain, cover the vessel, and allow it to soak for forty-eight hours till the grain has taken up all the water it will, then spread out to dry and store in jars. (b) 56lbs. small grain wheat, $\frac{1}{2}$ oz. strychnine, 1oz. acetic acid, 7qrts. water. Mix acid and strychnine in a bottle containing 1pt. water; shake and let stand two hours. Then mix the solution with the rest of the water, and pour the wheat slowly into the poisoned water. Stir frequently during two or three days, using a flat board, so as to get a thorough mixture. Finally dry the wheat on iron sheets, and destroy by fire or thoroughly cleanse all articles used in making the poisoned bait.

ARSENIC.—(a) 1lb. arsenic, 1lb. washing soda, 1lb. sugar, 2galls. water. Boil the soda and sugar, and, when boiling, mix the arsenic to the consistency of a paste, and add to the contents of the boiler; continue to boil for about fifteen minutes, and keep well stirred. Place about 40lbs. of wheat in an iron tub, and pour the contents of the boiler over it. Allow to stand till the water is nearly absorbed, then dry in the sun and store in jars. (b) One part arsenic, fifteen parts cornmeal, one part sugar; stir all together dry, then moisten and lay.

PHOSPHORUS.—Three quarts water, 4ozs. phosphorus, 3lbs. sugar. Boil the water, and then add the phosphorus and sugar. When quite dissolved add as much wheat as the mixture will cover, and stir well for at least ten minutes. To secure satisfactory results the birds should be fed on sound grain for several days before any poison is laid, as they are very suspicious.

KEEPING BUTTER COOL.—A writer says that a simple mode of keeping butter in warm weather is to invert a large crock of earthenware, or a flower pot if need be (varying with size of the vessel containing the butter), over the dish or firkin in which the butter is held. The porousness of the earthenware will keep the butter cool, and all the more so if the pot be wrapped in a wet cloth, with a little water in the dish with the butter. Not the porosity of the earthenware, but the rapid absorption of the heat by external evaporation, causes the butter to become hard.

AGRICULTURAL SHOW SOCIETIES.

With a view to placing before those interested in agricultural shows information in a concise form concerning such, a circular was forwarded to the secretaries of all the recognised South Australian societies asking them to furnish for publication the particulars as set forth in the table herewith. The majority courteously complied with our request, but nine have not done so. In the table herewith, the actual date of establishment and value of improvement have not always been given, but they are approximately correct. In the money columns the shillings and pence have been omitted.

The agricultural societies are subsidised by the State to the following extent:—The Royal Agricultural and Horticultural Society receives a grant of £800, while the country societies participate in a vote of £1,500, which is divided *pro rata* according to the operations of each society.

The Royal Agricultural and Horticultural Society holds two shows (autumn and spring) of three days each, as well as a wine show, and a vine-pruning match.

Agricultural Show Societies—continued

Name of Society.	Name and Address of Secretary.	Date of Establishment.	Usual Date of Show.	Date of next Show.	Prize Money Awarded at latest Show.	Subscriptions Collected last Year.	Subsidy for 1899.	Particulars re Show Grounds and Improvements.
Angaston	W. Hague, Angaston	1890	February	Not fixed	—	—	28	Show held in Angus Park; improvements the property of society.
Balaklava and Dalkey ..	David Virgo, Balaklava	1875	September	Sept. 28	210	55	45	Show grounds leased; permanent improvements valued at \$400.
Belahie	Richd. Rowe, Jamestown	1874	Second Wednesday, October	Oct. 10	221	118	48	Show ground part of park lands; permanent improvements valued at \$325.
Booyoolie	W. H. Campbell, Laura	1873	Last Wednesday, September	Sept. 26	183	95	40	Show ground the property of society, and, with improvements valued at \$400.
Burra and North-Eastern	Jno. McLaren, Koorunga	*1894	Third Wednesday, September	Sept. 21	190	140	41	Show ground belongs to corporation; improvements valued at \$90, besides half cost of large shed.
Central Yorke's Peninsula	D. G. Teichmann, Minlaton	1878	Middle October	Oct. 24	169	70	37	Show ground on park lands; permanent improvements valued \$600.
Eudunda	W. H. Marshall, Eudunda	1896	September	Sept. 21	62	55	14	Improvements valued \$15.
Franklin Harbor	S. Teasdale, Cowell	1895	September	Sept. 5	60	44	13	Show grounds belong to district council; improvements, including clearing, \$75.
Gawler	A. G. Wells, Gawler	1860	September	Sept. 19	395	136	86	Grounds leased from corporation; society's improvements valued at \$150.
Kapunda and Light	Thos. Jeffs, Kapunda	1865	Fourth Wednesday, September	Sept. 26	226	108	49	Show ground belongs to society, and, with improvements, valued at \$1,600.
Kingston	F. Burns, Kingston	1867	End October	Oct. 25	117	115	23	—
Lucindale	A. Matheson, Lucindale	1890	End October	Oct. 31	104	96	23	Show ground belongs to society, and, with improvements, is valued at \$165.
Maitland	J. O. Tiddy, Maitland	1887	Third Wednesday, October	Oct. 17	123	46	27	Show ground on park lands; improvements valued at \$270.
Millicent	G. D. E. Plunkett, Millicent	1876	Last week October	Oct. 31, Nov. 1	189	98	41	Ground dedicated; improvements valued at \$350.
Moonta	W. N. Elford, Moonta Mines	1871	Second week October	Oct. 10	137	88	26	Show ground on land granted to society; improvements valued at \$325.
Mount Gambier	B. J. Daniel, Mt. Gambier	1863	Middle October	Oct. 17 and 18	31	221	68	Show ground belongs to society, and, with improvements, valued at \$3,000.

Mount Pleasant	F. Dowell, Mount Pleasant	1862	Third Thursday, March	Not fixed yet	242	136	55	Ground belongs to society; mortgaged at £160; improvements about £900.
Naracourte	Jas. McGlechrist, Nara- courte	1865	Middle September	Sept. 20, 21	215	182	47	Improvements valued at £1,000; ground leased.
Northern	E. W. Castine, Auburn	1857	March	In recess	100	No show	—	Show ground belongs to society and, with improvements, is valued at £160.
North-Western	Mark Weston, Crystal Brook	1875	First Wednesday, September	Sept. 5	246	81	53	Ground, park lands, dedicated to society; improvements about £300.
Penola	L. W. Peake, Penola	1868	Last Wednesday and Thursday, Sept.	Sept. 26, 27	212	181	46	Ground the property of the society, and, with improvements, is valued at £700.
Petersburg	Jas. Wilson, Petersburg	1884	October	Oct. 17	157	71	34	Ground the property of the society; ground and improvements valued at £470, on which there is a loan of £235.
Port Pirie	M. C. Copinger, Port Pirie	1881	September	August 29, 30	211	98	46	Improvements valued at £30; ground not the property of society.
Port Wakefield	J. J. Thomas, jun., Port Wakefield	1879	September	Sept. 21	110	45	22	Ground the property of society, and, with improvements, valued at £300.
Royal Northern	H. A. Wigzell, Quorn	1884	September	Not fixed	143	No show	—	Ground on Crown lands; improvements worth about £150.
Snowtown	C. Green, Snowtown	1884	September	Sept. 19	240	89	51	Ground the property of society, and, with improvements, valued at £400.
Southern	C. W. Colman, Port Elliot	1869	November	Nov. 8	173	109	38	Ground the property of society, and, with improvements, valued at £500.
Stanley	Jas. Bentley, Clare	1889	First week October	Oct. 3	219	168	48	Ground the property of society, and, with improvements, valued at £300.
Strathalbyn	W. F. Adams and H. L. Tucker, Strathalbyn	1855	First week October	Sept. 27	184	147	38	Ground the property of society, and, with improvements, is valued at £1,000.
Tatiara	Jos. Lambert, Bordertown	1875	October	Oct. 24	136	74	29	Ground dedicated to society; estimated cost of improvements being made £400.
†Two Wells Amalgamated	Jno. Kingdon, Two Wells	1860	First week October	Oct. 4	219	86	48	Ground vested in society; improvements valued at about £500.
Willowie	W. J. Bull, Willowie	1882	September	In recess	162	Recess	—	Ground the property of the society, and, with improvements, valued at £240.
Willunga, Aldinga, Mc- Laren Vale & Noarlunga	Chas. Lipson, Willunga	1856	Third Thursday, February	Not fixed	138	65	26	Part of ground the property of society, and, with improvements, valued at £650.
Yankalilla, Rapid Bay, and Myponga	J. E. Heathcote, Norman- ville	1882	First Thursday, November	Nov. 1	137	45	30	Ground the property of the society, and, with improvements, valued at £700.

* Restarted 1894 after shows having lapsed for a number of years.

+ Formerly Virginia and Port Gawler Society.

THE VINEYARD.

SEASONABLE NOTES.

By ARTHUR J. PERKINS, GOVERNMENT VITICULTURIST.

Weather conditions during the past month have proved so exceptionally good that we may well look forward to seeing our vines practically recovering from the effects of past droughts. I do not anticipate an exceptional vintage; too large a proportion of our vines had their fruit shoots destroyed by the October, 1899, frost. Good growth, however, the foundation of future good crops, should be general. Planting operations have been rather more active than had latterly been the case, and for this purpose a more auspicious opening of the season could not have been wished. It is probable that in view of the drawing out of the cold winter season, contrary to what the last few seasons have accustomed us, the 1901 vintage will be a late one. It is certain that the budding of the vines will be later than usual, and this generally affects the ripening and development of the fruit.

∴ ∴ ∴

Late rains have considerably hampered ordinary tillage operations, but with the return of fine weather the second ploughing should be rapidly completed, and the scarifiers and horse-hoes called into requisition. The sooner the soil is levelled and brought into a fine state of cultivation the better for the development of the plants.

∴ ∴ ∴

During the course of the present month grafting may be resorted to wherever required. It may be pointed out that this latter operation should be availed of, not only with the object of changing the variety on whole blocks of land, but also with a view of restoring old and injured stocks, of which a few will always be present in all vineyards. This practice is preferable to the one usually adopted, of cutting the old plant and utilising suckers that grow around the section.

The South Australian Vinegrowers' Association held a meeting in Adelaide on August 29th. I had intended being present, but unfortunately overlooked the date. I have cause to regret my unavoidable absence, for it would appear my name was the centre of much discussion. It is difficult, from newspaper reports, to ascertain what really takes place at such meetings. The reporter has an eye for the picturesque—not necessarily for unvarnished truth. In this connection the paragraph in the *Register* of August 30th, under title of "Who is to Blame?" may not exactly convey the spirit of the discussion. The substance of the matter would appear to be that my services are not sufficiently available to vinegrowers, and that too much of my time is taken in imparting instruction at the Roseworthy College. In reply to this grievance I might state that I have never refused to go anywhere, whenever I have been asked, unless at the time I had in hand work that could not be set aside, and in the latter case I have always made arrangements for some future appointment. If latterly I have not visited vine-growing centres as frequently as in the past, it is simply due to the fact that I have not been asked to do so. My occupations are many, probably more than one man can be reasonably expected to efficiently carry out. I have to teach at Roseworthy viticulture, wine-making, and fruit culture; I have the management of a vineyard, orchard, and wine cellars; I have to superintend and carry out laboratory work; I have fairly voluminous

official correspondence and reports to attend to; and in addition to that, whenever asked to do so, I have to visit and give lectures and practical demonstrations in different parts of the colony. Some years back the Vinegrowers' Association complained that owing to the fact of my being located at Roseworthy they were unable to consult me when desirous of doing so. To meet this difficulty the Minister of Agriculture arranged that I should be present at his office the first and third Wednesday of every month. This arrangement has been carried out, but I have rarely been favored with visitors. I fail to see that any special blame can be laid at my door for the grievances of the Association. I have been assigned work to do, and the latter I have carried out to the best of my ability.

WINE AND CELLAR NOTES.

BY ARTHUR J. PERKINS, GOVERNMENT VITICULTURIST.

With the gradual rise in temperature wines, especially new ones, will begin to show signs of movement. Where wines have been well made this need not give any cause for anxiety. Ease off the bungs, and allow the wine to work out. The second racking should have taken place before the first appearance of this phenomenon, as the evolution of gas is apt to disturb the lees and render turbid an otherwise bright wine. Where it is desired to check any such slight fermentation as may appear, the wine can be run into a strongly-sulphured cask: as a rule, however, such a practice is unnecessary. It would be wiser, wherever possible, to defer shipping wine until the following month. Nothing is more detrimental to its safe journey over sea than the slight fritting that will soon be apparent in most wines.

I append the analyses of some further wines sent recently to the London Depot:—

Reference Number and Type of Wine.	Specific Gravity.	Alcohol in Volume (per cent.).	Total Acidity in grams per litre as H_2SO_4 .	Fixed Acidity in grams per litre as H_2SO_4 .	Volatile Acidity in grams per litre as $C_2H_4O_2$.	Dry Residue in grams per litre.	Cream of Tartar in grams per litre.	Ash in grams per litre.
230—Dry Red	·996	13·7	4·55	3·72	1·01	29·85	3·54	4·20
231—Dry Red	·996	13·6	4·54	3·61	1·01	30·05	3·23	4·05
232—Dry Red ...	·994	14·6	4·26	3·44	1·01	26·45	3·31	3·80
233—Muscat	1·008	14·8	3·58	2·75	1·01	72·75	1·09	3·37

The composition of the above wines offers nothing that is very abnormal, excepting that the volatile acidity is somewhat high. This appears to be a common fault with all our wines, and arises principally from insufficient filling of the casks. In most of our cellars, however, it is somewhat difficult to maintain an even temperature during the summer months, which renders it difficult to avoid occasional ullage, however frequently the casks be examined. The alcoholic strength of No. 232 is rather high for a wine of that type, whilst 233, a Sweet Muscat, is perhaps a bit low. The poverty of the Muscat in cream of tartar may be noted as characteristic of wines of this class.

The above analyses were carried out by Mr. H. E. Laffer, in my laboratory.

PRODUCE EXPORT DEPARTMENT.

BY THE MANAGER.

RABBITS.—The rabbit export season will practically end with August. The exports since June have been—

11,411 crates, containing 296,726 rabbits ;
 8 “ “ 128 hares ;

making a total of 36,267 crates, containing 916,432 rabbits, and 8 crates, containing 128 hares, treated for this season, commencing in April last, which compares most favorably with the 16,431 crates, containing 407,096 rabbits, shipped during the previous season.

ORANGES.—The good prices realised last season have induced growers to again try the London market with this fruit, and 1900 season shipments have been—

June 28th, <i>Ophir</i>	78 cases
July 12th, <i>Oruba</i>	75 “
“ 26th, <i>Austral</i>	150 “
August 9th, <i>Ormuz</i>	62 “
“ 23rd, <i>Omrāh</i>	150 “
A total of	515 cases

WINE.—The department during July and August has shipped for sale through the London Dépôt 12,035 galls. of wine, on behalf of various shippers.

BUTTER.—The butter season has commenced, and the shipments to date have reached the total of 34 tons 16cwts. 1qr. The department is prepared to receive, chill, ship, and sell butter on behalf of shippers; and persons intending to forward consignments must sign the new contract entered into with the mail companies for the carriage of butter, copies of which will be supplied on application.

MEAT.—Every effort is being made to cope with this increasing business. The season commenced in August, and persons wishing to forward consignments for sale through the department should make early application for freezing space, so that the necessary freight and other arrangements can be made.

The following are reports received from the manager of the London Dépôt on last season's shipments of lamb and fruit forwarded to him for sale:—

“**LAMBS.**—For the most part the quality of the lambs shipped was not equal to last year's shipments, many of them being of a very plain description. It is somewhat unfortunate that Australian lambs arrive on this market at a very unfavorable time of the year, and to make matters worse, so far as this season is concerned, a considerable number of New Zealand lambs which arrived late were held over in cold store, and this, together with the much larger shipments from Australia, had a considerable influence upon the prices, which, it will be seen, are less than those obtained last year. It may be urged that, all told, the quantity after all was comparatively not great. But it must be borne in mind that the market for lambs in the winter is very limited. As I pointed out in my report last year, the great proportion of frozen lamb is not consumed as New Zealand or Australian, but simply as ‘lamb.’ I used the word ‘consumed’ advisedly, because I think that it is sold by the salesmen in the first instance as frozen lamb, and generally, though not always, by the butchers. It is when it comes to be consumed that its origin is dropped. There is no doubt that large quantities are used by hotels and restaurants, who simply call it ‘lamb’ on the bills of fare. Again, in lodging and private houses it is

used, but those who consume it are not enlightened. If the quality is good, which it generally is, no questions are asked. In the winter, however, it is clearly impossible to practice the pious deception, as every one knows there can be no English lamb on the market. Even as it is, it is surprising how early the lamb season begins and how long it lasts. The consequence of this is that those who consume frozen lamb in the winter do so knowingly and with their eyes open, but it would not appear upon any bill of fare in the United Kingdom, nor would any housekeeper have it on the table when there were guests. The consumption, therefore, must be necessarily limited. The large distributing 'stores' place a bold line in their catalogue, 'Lamb season is over.' The table of prices given herewith is, I think, a very accurate indication of the market, which is seen at its worst in January and February, slightly better in November or the extreme end of the lamb season, and again showing a gradual improvement towards the beginning of the next season. After Easter the prices for New Zealand lamb rose to 6d. and 6½d. a pound. The differences in the expenses between the various shipments above mentioned is due to the length of time the lambs were kept in cold store. I kept back several shipments as long as I thought safe; but experience shows that it does not pay to keep lambs for any length of time in cold store. Apart from the extra storage charges incurred, the meat deteriorates, shows badly, and quickly goes off after exposure if kept in a cold store for long.

Ship.	Landed.	Date of Sale.	Average Price per Pound.	Total London Charges per Pound.
			d.	d.
<i>Warrigal</i>	October 2nd, 1899	November	3·87	·48
<i>Narrung</i>	November 3rd, 1899	December	3·98	·41
<i>Wilcannia</i>	December 14th, 1899	January	3·81	·33
<i>Gulf of Siam</i>	December 16th, 1899	January and February	3·63	·42
<i>Warinambool</i> ..	January 5th, 1900	February and March	3·49	·46
<i>Devon</i>	March 8th, 1900	March and April	3·86	·31
<i>Warrigal</i>	March 14th, 1900	March and April	3·99	·36
<i>Gulf of Genoa</i> ..	April 11th, 1900	April	4·16	·32

"APPLES.—I have the honor to inform you that during the fruit season 2,115 cases of apples were shipped to the depôt, the average price realised being 13s. 6d. a case. The average, however, was considerably affected by the over-ripe condition in which the *India* and *Australia* shipments arrived; the latter, unfortunately, being the largest shipment of the season. Another circumstance which tended to lower the price was the arrival within one week of four cargoes of Australian and Tasmanian apples, with a total of about 50,000 cases, or about three times the normal supply. There is little to be said in regard to the packing, which, generally speaking, was very good, though in some instances there was a want of care in properly grading the fruit. This, I would again remind shippers, it is very desirable should always be carefully done, as well-graded fruit will invariably bring better prices than non-graded. The wood wool used to fill up the small spaces gave a very much better appearance to the fruit than the paper shavings. Of course, the latter are good, but the wood wool is better, and, as it can now be procured much more cheaply than formerly, I hope next season it will be more used.

"PEARS.—A few trial shipments of pears were made, which turned out badly. As I have frequently pointed out, a trade in pears can never be conducted so long as they are shipped with the apples. Soft fruit, such as pears and grapes, should be shipped at a much lower temperature than apples.

"ORANGES.—Last year a few hundred cases of oranges were shipped to the depôt, which averaged 14s. 2d. a case. They were, however, by no means of the best quality, some being rather dry, and many of small size. There is no doubt a good trade is to be done in fruit of good quality, especially in the Navel orange. Growers should undoubtedly turn more attention to the cultivation of this orange. When once its merits have become thoroughly known I believe a large and profitable trade could be done."

WEATHER AND CROP REPORTS.

AMYTON.—Very little rain has fallen for two months, and a good soaking rain is badly needed. The early wheats have for six weeks past been in ear. Farmers are busy fallowing; stock in good condition; feed plentiful, but myriads of grubs or caterpillars are injuring it now.

ARTHURTON.—The last week in July and first week in August were dry, with very high winds and occasional frosts. Then rain set in, continuing more or less since. Everything is looking better. Dams are being replenished, and the outlook is brighter; feed is abundant; stock generally are looking well.

BALAKLAVA.—The season is all that could be desired, splendid rains having again fallen. There are complaints of grubs eating the crops, and of takeall having made its appearance in several places; but crops and feed are coming on well, some coming into head. Stock fast improving in condition. Fallowing about finished, although some have decided to do more since the late rains. Frosts are conspicuous by their absence this year, but grubs are doing a lot of harm in some parts.

BAKARA.—During the latter part of month the weather has been cold and showery. The crops are looking well, but in many cases are rather backward. Feed is not yet plentiful, owing to dry weather in the earlier months. All stock in good condition.

BOULEROO CENTRE.—The weather is all that can be desired. Feed and wheat are coming on well, and very forward. The rains have been mild and soaking, but dams are filling. A good harvest is expected.

BOWHILL.—Have had nice showers lately, about three-quarters of an inch having fallen. Takeall is showing itself already in late crops. Stock generally in good condition.

BRINKWORTH.—The weather has been cold and stormy, with very little frost. Crops are still looking well. Stock doing well.

BURRA.—Good rains have fallen. The crops are not so forward as they were this time last year.

CARRIETON AND YANYARRIE.—Crops are looking fairly well with few exceptions. In some places the seed malted, causing a few failures. Most farmers are busy fallowing, and a fair amount of land is ready for next seeding. Caterpillars are plentiful, and are eating the herbage, but so far have done no harm to the young wheat. In the beginning of month we had very severe frosts, but on the 16th about half an inch of rain fell. Rainfall to date for the year at Carrieton is a little over 8ins., and about 1in. less at Yanyarrie. Stock is improving, and a fair amount of dairy produce is being sent away.

CHERRY GARDENS.—Crops are looking fairly well. The heavy rains of this month have prevented planting work. Many gardeners have increased their orchards this season.

CRYSTAL BROOK.—The weather has been very changeable. Crops are looking well, and in some cases are almost ready for hay. Stock in good condition.

DAWSON.—The want of rain during the end of July and beginning of August had a disastrous effect on crops and pasture. At present the prospects are very discouraging, and unless the spring is exceptionally favourable, this will be one of the worst seasons ever experienced here. The only plant that is growing is one of the mustard family, and although stock are doing fairly well on it, it has a bad effect on milk and butter. The rainfall for the year to August 11, 3.30ins.

EUNUNDA.—July was a dry month for this district, but good rains have fallen this month, and the prospects for a good harvest are very favorable.

FINNISS.—Weather has been cold and showery, with occasional frosts, but it has had no effect upon early manured crops, which as well as grass are growing freely.

FOREST RANGE.—The weather has been wet, but seasonable. The frosts have been very light this year.

FORSTER.—The weather has been very cold, and in the early part light showers fell; but later there have been some very severe frosts, but no serious damage has been done. Stock are looking well. Feed is plentiful. Fallowing in full swing.

GAWLER RIVER.—The weather is very favorable, and the ground has had a good soaking. Crops looking very promising, but some are too early, being in ear already. Feed plentiful. Fallowing almost finished. Garden work and first sprayings progressing.

INKERMAN.—The weather has been very favorable, and the crops are improving.

JOHNSBURG.—Nice rains have fallen recently, totalling half an inch, but lot of rain during September is needed to ensure anything like a fair crop. Crops and feed are very backward for this time of the year, and the outlook is not very bright. Fallowing is going on, and stock are in fair condition.

KAPUNDA.—Have had a splendid season so far. It is a good season for vegetables, but rather cold for rapid growth in wheat crops.

LIPSON.—Weather still continues showery, splendid rains having fallen. The early manured crops are showing out in ear, and the late crops have a good chance.

MAITLAND.—The month has been splendid, and the crops are looking well. The middle of the month was very wet. Feed is abundant, and the prospects for farmers are good. Cattle very dear.

MALLALA.—During the early part of the month the weather was dry, but good rains have fallen lately. The crops have very much improved. The prospects for the harvest are very good. Much, however, will depend on the weather of the next few weeks. Fallowing is nearly finished, and feed for all kinds of stock is fairly plentiful.

MILLICENT.—The weather during the month has been very wet, and at times extremely stormy, with hail and snow on the ranges. A good many crops injured by the water lying on them, and growth generally very slight, owing to cold. Stock looking well, and good lambing generally.

MINLATON.—Splendid rains have fallen this month, accompanied by some thunder and lightning. The ground has had a thorough soaking, and with moderate rains next month heavy yields should result. Very little frost.

MOUNT PLEASANT.—In the South Rhine district wheat crops are commencing to make headway, and on the Murray Plains they are patchy, with occasional promising crops. Stock looking well.

MOUNT BRYAN EAST.—Since my last there has been nice rain in this district. The land has had a thorough soaking. The weather has been rough and cold at times. The wheat and grass is coming on nicely, and there is every prospect of a good season so far. The stock are improving in condition.

NANTAWARRA.—Stock improving and feed is plentiful, except in overstocked localities. Rainfall for year 10in. Wheat is doing fairly well, as splendid soaking rains have fallen, but not much water has been caught in dams. Some patches in the drilled crops are going off like takeall, although having a different appearance to takeall in broadcasted crops. Fallowing is about finished, and farmers are busy working the fallow down.

ORROROO.—Good rains have fallen of late, and crops and grass are expected to do well. Fallowing is being pushed on, and stock in fair condition.

ONETREE HILL.—Good rains have fallen lately. The season so far is splendid—crops looking well, and feed is coming on splendidly.

PASKEVILLE.—Crops are looking well owing to rains having fallen during middle of the month, before which time they were very poor. A good deal of water has been caught in the dams. Feed fairly plentiful and stock in fair condition. Fallowing almost completed, and many have started to work it down.

PENOLA.—Very heavy rains have fallen this month, and the weather has been rough, but no frosts. Springs are rising and swamps are filling up. Stock in good condition. Manured and drilled crops are looking well, but others are showing bad effects from the cold. Apricot and peach trees are blooming.

PETERSBURG.—Nice rain has fallen lately, reviving the prospects of both wheat and grass. The continued extremely cold weather retards the growth of all vegetation. Should rain and suitable weather come in September a fairly productive crop may be expected. The number of cattle and sheep in the district is considerably reduced by the late droughts.

PINE FOREST.—Splendid weather for growing crops. Grass looking well. Stock in good condition.

PORT ELLIOT.—Weather continues favorable, but about middle of month it was very windy and cold.

PORT GERMAIN.—The rainfall for past month has been very light, with frosts, which have retarded the growth of late sown crops. The early varieties are well advanced. Haymaking will commence in a fortnight's time; the cut will be satisfactory.

PORT PIRIE.—Good weather for growing crops prevailed this month, excepting for a few frosts. More rain required. Wheat is growing strong, but inclined to spindle up. Cape barley crops are growing well, and the town is supplied with green feed from them. Pastures are in good growth. Most of the herbage is in full bloom, but without rain coming soon little grass is expected for summer. Lambing generally has been good. Stock in good condition and rapidly improving.

PYRAP.—Very high winds have been experienced, and their effects are shown on the crops. Have only had a little rain.

RADHILL.—At beginning of month very little rain fell, and had very strong and cold winds,

since then we have had nice rains, which have benefited the crops, and they now look well. Stock in good condition, as there is plenty of feed. Lambing fair. Fallowing is finished in parts.

RIVERTON.—Very cold, boisterous, and wet weather has been experienced throughout the month. In some parts of this district rather too much rain has fallen. The crops continue to stool well, and with a week or two of fine weather the crops will make splendid headway. The prospects of large yield of hay and wheat have not been so favorable for some years.

ROBERTSTOWN.—Seasonable weather, with good rains experienced during the month.

SCALES BAY.—The weather has been cold, but the rainfall has been fair. Early-sown crops look well, but late sown have hardly covered the ground. Lambing is good, with 70 per cent. at the lowest. Stock in good condition. Fallowing general.

SADDELEWORTH.—Soaking rains lately, with cold winds. Few flakes of snow on 16th. Wheat is stooling out well, and the late sown crops may now give good returns. A splendid grass seas n. Cape weed among some early sown crops on sandy soils is very strong. Rainfall for year to date, August 21, 14.1 in.

STANSBURY.—The month has been very favorable, and crops are looking well. Some farmers are complaining of takeall and grubs. A small fly is reported to be attacking the wheat plants.

WILSON.—The weather is very dry. Crops are backward, and being burnt up by the dry weather and hot winds. Frost has done harm. If rain does not fall early and plentifully the prospects will be very black indeed. We have had no really good rain since June. Feed is scarce and will go early. Changes come quickly but bring no rain.

MISCELLANEOUS NOTES.

FIREPROOF PAINT.—In a covered vessel slake the best quicklime, then add mixture of skim milk and water and mix to consistency of cream. To each 10 galls. add 2 lbs. alum, 1½ lbs. potash, and 4 lbs. salt. If a white paint is desired add 8 ozs. plaster of Paris.

PAINT FOR FENCES OR SHEDS.—Slake ½ bush. lime in boiling water, keeping it covered; strain and add brine made by dissolving one peck salt in warm water and 3 lbs. rice flour, then boil to a paste; add 8 ozs. whiting and 1 lb. glue dissolved in warm water. Mix thoroughly and let stand for several days.

WHAT IS VINEGAR?—The word "vinegar" is derived from the French "vin aigre," which literally means "sour wine." The vinegars of commerce are divided into two classes. In one class the sugar of various substances is changed by fermentation into alcohol, and the latter is again changed into acetic acid by another ferment (*Mycoderma aceti*). The vinegars from wine, malt, cider, sugar, belong to this class. The other kind, pyroligneous acid, is obtained by the distillation of wood. When wood is heated in iron retorts out of contact with air, gases are evolved, and water, tar, and other products are collected in receivers, while the coke or charcoal remains behind. From the liquor, on rectifying, acetone, wood alcohol, and acetic acid are separated and purified. The wood vinegar, or spurious vinegar of commerce, is made by diluting this acetic acid with water, and coloring it with caramel (burnt sugar), to match the appearance of malt and other standard vinegar.

THE POULTRY INDUSTRY OF RUSSIA.—During the past ten or twelve years the poultry industry of Russia has developed to an enormous extent. In 1887 poultry and poultry products to the value of £1,310,000 were exported; in 1897 these figures reached £3,530,000; and 1898 shows a still further increase, the exports of eggs alone being valued at £3,113,000. In 1887 507 millions of eggs were imported; in 1898, 1,831 millions. Germany and Austria take 60 to 70 per cent. of these, Great Britain coming next with 22 per cent. Live poultry more than doubled in value during the ten years, and in 1897 was valued at £637,000. Dead poultry totalled £208,000. The former go principally to Germany and the latter to Great Britain. Twenty-two thousand five hundred tons of down and feathers are also exported, and about 15,000 tons of whites and yolks of eggs.

AGRICULTURAL AND LIVE STOCK STATISTICS, 1899-1900.

DISTRIBUTION OF LAND.

Year.	Leasehold.	Freehold.	Cultivated.
	Acres.	Acres.	Acres.
<i>Central Division.</i>			
Total 1899-1900	3,725,353	2,286,243	1,032,172
Total 1898-1899	3,663,360	2,224,956	1,012,253
<i>Lower North Division.</i>			
Total 1899-1900	4,930,850	2,095,100	936,338
Total 1898-1899	4,913,840	2,062,437	888,864
<i>Upper North Division.</i>			
Total 1899-1900	8,382,177	734,137	828,641
Total 1898-1899	8,343,272	675,652	804,420
<i>South-Eastern Division.</i>			
Total 1899-1900	4,031,707	1,351,132	94,965
Total 1898-1899	3,705,412	1,309,288	101,935
<i>Western Division.</i>			
Total 1899-1900	8,374,954	153,072	189,730
Total 1898-1899	8,551,747	140,934	169,898
Grand total 1899-1900	29,445,051	6,619,684	3,081,846
Grand total 1898-1899	20,177,631	6,413,267	2,967,370

CROPS UNDER GRAIN.

Year	Wheat		Barley.	Oats.
	Acres.	Produce.	Produce.	Produce.
		Bushels.	Bushels	Bushels.
Central Division.				
Total 1899-1900	533,543	2,840,324	115,164	117,392
Total 1898-1899	544,901	3,589,237	124,130	146,774
Lower North Division.				
Total 1899-1900	546,697	2,554,874	12,406	16,348
Total 1898-1899	526,842	2,825,500	19,407	33,004
Upper North Division.				
Total 1899-1900	535,912	2,056,360	2,730	280
Total 1898-1899	531,712	1,390,624	4,832	—
South-Eastern Division.				
Total 1899-1900	43,450	326,134	42,887	75,175
Total 1898-1899	49,725	525,544	74,754	119,217
Western Division.				
Total 1899-1900	161,535	675,443	15,730	9,166
Total 1898-1899	135,590	457,996	11,012	5,007
Grand total 1899-1900 ..	1,821,137	8,453,135	188,917	216,331
Grand total 1898-1899 ..	1,788,770	8,778,900	234,135	304,002

The area under barley was 15,767 acres as against 16,964 acres in 1898-9, and the area under oats 20,229 acres as against 25,823 acres.

VITICULTURAL STATISTICS.

Year.	Acres.	Wine from Vintage 1899.	Grapes Sold.	Raisins Made.	Currants Dried.
		Galls.	Cwts.	Cwts.	Cwts.
Central Division.					
Total 1899-1900	16,022	896,912	98,107	1,017	2,260
Total 1898-1899	15,877	1,016,082	119,940	1,595	822
Lower North Division.					
Total 1899-1900	2,510	41,455	7,160	4,365	783
Total 1898-1899	2,450	40,490	5,387	4,572	305
Upper North Division.					
Total 1899-1900	356	—	1,462	15	3
Total 1898-1899	348	—	2,122	17	6
South-Eastern Division.					
Total 1899-1900	510	16,000	1,272	—	—
Total 1898-1899	451	24,000	1,698	5	—
Western Division.					
Total 1899-1900	40	—	45	1	1
Total 1898-1899	33	200	61	1	1
Grand total 1899-1900	19,438	954,367	108,046	5,398	3,047
Grand total 1898-1899	19,159	1,080,772	128,608	6,190	1,133

The total number of vines in bearing was 9,032,083 as compared with 8,814,086 in 1898-9, while the vines not in bearing numbered 1,310,948 as against 1,355,014.

HORTICULTURAL STATISTICS.

Year	Almonds.	Oranges.	Lemons.	Olives	Wattle Bark.
	No.	No.	No.	No.	Tons
<i>Central Division.</i>					
Total 1899-1900	102,460	92,064	38,614	47,604	6,548
Total 1898-1899	96,078	87,425	37,807	45,053	6,894
<i>Lower North Division.</i>					
Total 1899-1900	20,334	13,412	21,040	10,526	110
Total 1898-1899	20,130	12,048	21,776	9,532	146
<i>Upper North Division.</i>					
Total 1899-1900	5,242	5,573	2,868	415	—
Total 1898-1899	8,481	5,357	2,813	293	3
<i>South-Eastern Division.</i>					
Total 1899-1900	5,627	852	1,238	1,557	1,380
Total 1898-1899	5,550	730	1,190	1,014	1,162
<i>Western Division.</i>					
Total 1899-1900	592	264	78	1,475	—
Total 1898-1899	562	114	68	1,445	12
Grand total 1899-1900	138,255	112,165	63,838	61,577	8,038
Grand total 1898-1899	130,801	106,674	63,654	57,337	8,217

The produce of last season was 2,652 against 1,325 cwts. of almonds, 36,990 against 27,520 cases of oranges, 13,975 against 6,860 cases of lemons, and 4,865 against 3,180 gallons of oil. There were 12,182 hives of bees, the produce being 523,981 lbs. of honey, as against 866,084 lbs. in 1898-9. The area under gardens, exclusive of vineyards, was 8,524 against 7,904 acres, the orchards totalling 15,477 against 14,396 acres.

GREEN FORAGE.

Year.	Wheat, Oats, or Barley.	Lucern.	Sown Grasses.	Silos.	
	Acres.	Acres.	Acres.	No.	Cub. ft.
<i>Central Division.</i>					
Total 1899-1900	716	4,431	997	60	43,358
Total 1898-1899	777	4,245	901	87	106,274
<i>Lower North Division.</i>					
Total 1899-1900	36	4,984	386	5	4,200
Total 1898-1899	118	3,953	310	5	4,040
<i>Upper North Division.</i>					
Total 1899-1900	—	1,358	20	—	—
Total 1898-1899	—	197	—	—	—
<i>South-Eastern Division.</i>					
Total 1899-1900	352	583	20,190	15	8,215
Total 1898-1899	357	480	19,735	17	8,182
<i>Western Division.</i>					
Total 1899-1900	—	—	—	—	—
Total 1898-1899	—	24	—	2	2,280
Grand total 1899-1900	1,104	11,356	21,593	80	55,773
Grand total 1898-1899	1,252	8,899	20,946	111	120,776

PEAS, POTATOES, AND HAY CROPS.

Year.	Peas.		Potatoes.		Hay.	
	Acres.	Total Produce.	Acres.	Total Produce.	Acres.	Total Produce.
		Bush.		Tons.		Tons.
<i>Central Division.</i>						
Total 1899-1900	3,760	51,930	1,974	6,186	166,562	134,117
Total 1898-1899	3,316	49,175	1,757	5,960	167,295	157,016
<i>Lower North Division.</i>						
Total 1899-1900	—	—	9	6	85,642	51,597
Total 1898-1899	—	—	—	—	90,352	60,927
<i>Upper North Division.</i>						
Total 1899-1900	—	—	—	—	38,439	26,325
Total 1898-1899	—	—	10	12	39,220	22,547
<i>South-Eastern Division.</i>						
Total 1899-1900	82	953	6,423	13,524	12,095	13,219
Total 1898-1899	175	1,976	4,868	8,458	12,112	13,842
<i>Western Division.</i>						
Total 1899-1900	—	—	—	—	8,702	4,542
Total 1898-1899	—	—	18	15	7,434	4,186
Grand total 1899-1900	3,842	52,883	8,406	19,716	311,440	229,800
Grand total 1898-1899	3,491	51,151	6,653	14,445	316,413	258,518

In addition to the crops included in this and the previous tables, there were 1,520 as against 1,002 acres under other crops last season, and 322,013 against 734,610 acres in fallow.

DAIRY COWS, BUTTER, AND CHEESE.

Year.	Milch Cows.	Butter.	Cheese.
		Lbs.	Lbs.
<i>Central Division.</i>			
Total 1899-1900	44,028	3,729,464	513,480
Total 1898-1899	40,483	3,173,785	476,445
<i>Lower North Division.</i>			
Total 1899-1900	15,913	859,315	2,030
Total 1898-1899	14,729	627,292	1,315
<i>Upper North Division.</i>			
Total 1899-1900	10,775	521,326	1,180
Total 1898-1899	9,996	349,224	10,073
<i>South-Eastern Division.</i>			
Total 1899-1900	10,500	450,586	430,210
Total 1898-1899	9,498	392,115	445,290
<i>Western Division.</i>			
Total 1899-1900	1,626	20,540	—
Total 1898-1899	1,453	16,267	—
<i>Outside Districts.</i>			
Total 1899-1900	685	—	—
Total 1898-1899	650	1,000	—
Grand total 1899-1900	83,527	5,581,231	946,930
Grand total 1898-1899	76,719	4,559,683	923,123

LIVE STOCK.

Year.	Horses.	Milk Cows.	Other Cattle.	Sheep.	Pigs.
	No.	No.	No.	No.	No.
<i>Central Division.</i>					
Total 1899-1900	65,544	44,028	34,800	992,357	44,150
Total 1898-1899	61,860	40,483	31,381	872,715	32,444
<i>Lower North Division.</i>					
Total 1899-1900	37,900	15,913	20,616	1,088,263	16,944
Total 1898-1899	36,124	14,729	19,176	978,926	13,188
<i>Upper North Division.</i>					
Total 1899-1900	27,455	10,775	18,410	670,146	11,283
Total 1898-1899	26,766	9,996	16,768	475,660	8,124
<i>South-Eastern Division.</i>					
Total 1899-1900	17,851	10,500	27,166	1,488,046	8,160
Total 1898-1899	17,905	9,398	26,751	1,331,500	4,833
<i>Western Division.</i>					
Total 1899-1900	7,775	1,626	3,818	381,626	2,010
Total 1898-1899	7,193	1,453	3,645	341,105	1,289
<i>Outside Districts.</i>					
Total 1899-1900	12,170	685	87,457	1,46,845	354
Total 1898-1899	11,926	650	85,913	1,009,805	324
Grand total 1899-1900	168,695	83,527	192,267	5,667,283	82,901
Grand total 1898-1899	161,774	76,709	183,634	5,012,620	60,132

In addition to the above there were 7,399 against 6,554 goats in the previous year, 2,864 against 2,652 other stock, and 1,122,812 as against 1,004,680 poultry.

THE STANDARD BUSHEL.

A conference was held on Friday, August 3, at the Chamber of Commerce, Adelaide, to consider the question of the standard bushel for wheat. The delegates present were Messrs. C. Giles, M.P., John Darling, M.P., and A. P. Hall, representing the Chamber of Commerce; Messrs. J. Hague, M.P., J. Black, and A. E. Davey, representing country millers and wheatbuyers; Messrs. A. Molineux (General Secretary), J. Miller, M.P., and Professor Lowrie, representing the Central Agricultural Bureau; and Messrs. W. J. Gleeson, J. Stone, and R. Marshall, representing the farmers.

Mr. GILES (Chairman of the Corn Trade Section of the Chamber of Commerce) was voted to the chair.

The CHAIRMAN said the secretary of the Chamber of Commerce had placed on the table standard samples of New South Wales, Victorian, and South Australian wheat, so that the delegates could compare them. The standards as fixed by the Chamber of Commerce for the last ten years were as follows:—1890–1, 64lbs.; 1891–2, 63lbs.; 1892–3, 62½lbs.; 1893–4, 63lbs.; 1894–5, 62½lbs.; 1895–6, 63lbs.; 1896–7, 63lbs.; 1897–8, 62lbs.; 1898–9, 63lbs.; 1899–1900, 63lbs. He would call upon Professor Lowrie to initiate the discussion.

Professor LOWRIE said it was a somewhat onerous task to have to take the lead in a discussion of this nature and to propose something which would to a certain extent interfere with the established usage of many years. He would in the first place thank the Chamber of Commerce for the way that body had met the request of the Central Agricultural Bureau for a conference, and it augured well when they found the merchant and producer alike prepared to adopt modifications of established customs when it could be demonstrated that they were for the benefit of the colony. For some years past he had felt that the standard sample of South Australian wheat on which the value of the crop was determined was not a fair "fair average quality" sample. He had reasons for his belief, and he would offer them in no dogmatic way, and he would be very sorry if his attitude on this matter was misunderstood in any way. It had been misunderstood since he first began to speak on the subject. It had been said that he had interfered where interference was not justified, and he had been accused of setting class against class. He deplored this, because it was a wrong construction. What he had done—and it was the same with the other members of the Bureau—was done in the belief that he was just as much justified in dealing with the subject as he was with any other matter connected with the agricultural interests of South Australia. He was merely trying to do all he could to earn his hire for the Government. He wanted it to be distinctly understood that his action had been dictated by the belief that what he did was in the interests not only of the farmers, but the province generally. The discussion this year arose over the sample of wheat which the Corn Trade Section courteously supplied to the Central Agricultural Bureau, as representing the quality of the standard sample for 1900. When he saw that sample he had to confess as an agriculturist that it was not worthy of the colony. The sample had a high percentage of bunt in it; it had drake, unthrashed heads, and other things of a detrimental character. Of course one always expected a certain percentage of this sort of thing, because they could not expect the entire crop to be as clean as farmers required their seed wheat to be, but he had an idea that the percentage was higher than it should have been. Allowing that the sample really represented the fair average quality of the season's crop, there was undoubtedly room for the farmers to go for something better, leaving the wheat dealers out of the question altogether. The present

arrangements for arriving at the standard sample, however, were unsatisfactory. If it was 63lbs. per bushel, something considerably under that weight had been allowed to get into the sample. Yet, as they all were aware, the wheat-buyers were in the habit of invariably "docking" whatever was below that weight in buying from the farmers. The sample now before them there must have contained some wheat that would be "docked." Surely this was an unsatisfactory position. The logical and only possible result was that if no "docked" wheat was put into the sample by the Corn Trade Section, the average must have been more than 63lbs. to the bushel. The reason was that 63lbs. was the minimum, and he knew very well that a large proportion of the farmers in South Australia delivered wheat weighing 64½lbs. or 65lbs. He had very good reasons to know that the shipments which went home were mostly 64lbs. or 64½lbs. wheat. Mr. Darling knew a good deal more about this matter than he possibly could, and perhaps that gentleman would say exactly what weight the average wheat shipped was. He believed it would at any rate be found to be considerably over 63lbs. By so much as it was above that weight by so much the agricultural industry in South Australia lost the value they produced. Then the present arrangement, which fixed the standard relatively low, was an injustice and a direct handicap to the best of the farmers. Every one of them would know of cases where clean farmers delivered wheat going 64lbs., 65lbs., or more pounds to the bushel, while others sent in stuff which had been once through the winnower and only reached the 63lbs. standard with difficulty and yet got the same market price exactly as the clean careful men. The latter took all the dirt out of his grain, and the result was that he had less to sell than the one who was careless and dirty, so that it did not pay to clean wheat too much, and the result in the end was that the reputation of South Australia suffered accordingly. He said positively that a farmer under the present system was well advised to deliver wheat just down to the sample, and if it was much higher, then the best thing he could do was to shovel some dirty wheat into it, because he got nothing for his work in cleaning it—less, in fact, because he had fewer bushels to sell when he winnowed it carefully. As one engaged in agriculture himself, and as a representative to some extent of the farmers, he hoped that the conference would arrive at some decision and would be able to suggest an arrangement which would not, as the present plan did, act as a drag or brake on progressive action. Then there was another aspect of the question which he confessed was somewhat invidious to touch on. He did not like to introduce the personal element or to make suggestions of unclean or underhand dealing, but the present arrangement gave millers the opportunity if they chose to take it of combining to affect our wheat values very considerably indeed. The price of wheat in South Australia was determined by the price in Mark Lane or wherever our wheat went, and it was fixed on the Chamber of Commerce standard sample. Our millers had to buy wheat at this price, and when it was gristed had to compete with the world with their flour. If by any means they could so affect the South Australian sample that the price it brought in England was a low one, by so much they would gain a handicap in the world's trade in the sale of their flour. It might be that this had not been done; it might be that all our millers were honorable and high-minded enough to refuse to take advantage of their opportunity in this direction, but it was unfortunate that the opportunity should exist. He would say he saw no reason why the direct milling interest should be affected by this matter at all. It was quite possible for South Australian millers to buy wheat by the sample at sight without having anything to do with the standard sample, which was meant for the outside market. The very fact that they could do so gave them an advantage, because they could go around and buy at a price just a shade better than that given by the exporter,

and pick up the best wheat all over the country. He supposed our millers got pretty well all the wheat they required at about 64½lbs. or 65lbs. to the bushel, and yet they probably paid but a fraction more than the ruling rate paid for 63lbs. wheat by the shipper who sold on the 63lbs. basis. The wheat in the various districts of South Australia was by no means a constant sample. From the South-East to the Far North it varied considerably in quality, and nearly every district differed from its neighbor. In the moister districts it was lighter, as might be expected, and in the dry districts, owing to the smaller percentage of water in it, it was heavier. Another point to be considered was that we had visitations of rust in certain districts, with the result that the shrivelled grain from those parts went into the general standard and the whole colony suffered from a disaster in one district. To avoid that he had a suggestion he would offer for discussion: It was whether it was practicable to have a constant standard, definite and determined, from year to year of South Australian wheat; also whether it was practicable to have a South Australian No. 1 wheat of 64lbs. to the bushel and a South Australian No. 2 wheat of 62lbs. to the bushel. He would say no more for the moment, and trusted he would be allowed to take part in the discussion which would ensue.

Mr. MILLER said there was no doubt that the reputation of South Australian wheat had gone down in the English market, and it was to the interest of the trader as well as the grower to maintain the character of our products at as high a standard as possible. As a farmer he could bear out Professor Lowrie's statement that there was much dissatisfaction caused by the practice of paying no more for well-cleaned wheat than for that which only just managed to reach the standard. It would therefore be a distinct advantage if the two standards the Professor proposed could be adopted, so that the good farmer would be encouraged. In fair seasons it was possible for most growers to clean their wheat up to 64lbs., and those who could not do it would get a fair price if there was a No. 2 standard at 62lbs. He did not see any reason for a variation of the standard from year to year. He noticed that in the last ten years the greatest range of variation was from 62lbs. to 64lbs., and of these years it had stood at 63lbs. for no less than six seasons. It was 62lbs. in 1898, 62½lbs. in 1893 and 1894, and 64lbs. in 1891. Seeing that the variation was so slight it would be much better to have a fixed standard. He was not anxious to raise it above 63lbs., but other farmers and members of the Bureau were, and he could sympathise with them, because they were trying to raise the general standard of cultivation and the preparation of wheat for market. If this could be done it would be a decided benefit to all parties. He hoped those who were trading in wheat would endeavor to assist the farmers to get back to a first-class standard. He would like the buyers to say what system they went on in "docking" inferior wheat, because the present practice was very irregular, and some buyers reduced the price much more than others. He would like to know what they considered was a fair deduction per bushel for wheat 2lbs. under the standard. He was not sure that it would be practicable to have two standards, because he knew one buyer who tried to give two prices and had to give it up. The farmers only wanted to produce the best article they could, and on behalf of them he was asking to be educated in the practices of the buyers, so that they would know what to do in future, both in their own interests and those of the colony. It was a great pity that the man who cleaned his wheat well could not count on getting a better price for it than the farmer who took no trouble.

Mr. STONE said he believed the trouble was becoming more intense each year. The low price of wheat had led farmers to look about for some means of improving their position. He thought it was quite possible to have some permanent standard, and he hoped some inducement would be offered to farmers to clean their wheat better. He had tried putting his wheat through

the winnower twice, so as to obtain a better sample, but he got no more for it than the man who put it through once, and the latter got paid for the screenings as wheat. Only last year one of his neighbors had 100 bags of screenings, and another had five. Both got exactly the same price for their wheat, with the exception that the latter had a lot more to sell than if he had cleaned his grain carefully. There should be a fairly high fixed standard for best wheat and a second grade for inferior.

The CHAIRMAN: Who was the buyer who gave the same price for dirty wheat as clean? It may help us to know.

Mr. STONE did not care to mention any names. When a farmer sold wheat which was not up to the standard he was "docked" for it, and he was not so sure that the "docked" wheat did not go into the same stack as that for which the top price was paid; in fact, he knew that very often it did. If there were separate standards no doubt the two qualities would be stacked separately and shipped as such.

Mr. GLEESON said he brought this subject forward in 1891, and the discussion had been going on pretty well ever since. Wheat buyers never gave anything for wheat over the standard, and yet never failed to dock anything below it, and this was what farmers objected to. The reputation of our wheat was by no means what it used to be, and it ought to be the object of both grower and trader to assist in putting the industry back in the position it had lost. He had a sample of wheat, grown in his district, which they would see was exceptionally fine. He believed it would go 65lbs. or 66lbs. to the bushel. It had been cleaned twice, but it fetched no more in the market than the ordinary quality. The grower ought to be compensated for his extra trouble in turning out a specially good sample. He believed if the suggestion made by Professor Lowrie was adopted it would infuse a spirit of emulation into the farmers, and be a means of improving the general quality of South Australian wheat. The farmers did not wish to interfere with the business arrangements of the wheat buyers, but he was sure they would see the reasonableness of the request they were laying before them. If a better article was produced all round the buyers would certainly benefit, because they would be able to command a better and more certain market. To arrive at the standard sample for 1900 now before them, it was evident that wheats from 58lbs. to 67lbs. per bushel were mixed together. If by any means the general standard of South Australian wheat could be raised to 64lbs., it would mean that there would be great competition on the part of buyers everywhere to get it.

Mr. MOLINEUX said this was not merely an agitation on the part of a few wheatgrowers. The Agricultural Bureau represented several hundred practical farmers, and he could say, as General Secretary, that the cry was not a weak one. He did not like to say anything that could be taken as a reflection on any of the members of the Bureau, but he thought that in the making up of the standard sample a mistake must have been made in accepting from some of the Branch Bureaus samples of wheat which had not been "sold without deduction," and he believed those lots had helped to deteriorate the quality of the general standard sample. He quite agreed with Professor Lowrie that something very much below 63lbs. to the bushel had gone to the making of the sample they had before them, and it followed from that of course that there was also a lot of wheat in it much above that weight.

Mr. MARSHALL said he agreed with former speakers that the present system was unsatisfactory, and that this year's standard sample contained a lot of wheat which must have gone below 63lbs. to the bushel. Surely it was just as much to the benefit of the buyers to improve South Australian wheat as to the growers, and he hoped the dealers would do all they could with this end in view. He strongly supported the proposal for a constant standard of 64lbs. for best wheat and 62lbs. for seconds.

Mr. HALL said he had for a number of years assisted in preparing a standard sample before it was generally recognised as such, and before the Corn Trade Section was affiliated with the Chamber of Commerce. Professor Lowrie had undoubtedly waked up the farmers of South Australia.

Mr. MILLER: Not before they wanted it.

Mr. HALL trusted they would profit by his teaching.

Mr. DARLING: He is waking up the traders now. (Laughter.)

Mr. HALL: There was no doubt the quality of South Australian wheat had deteriorated very much, but the mere fact of putting it twice through the winnower was not going to increase its value very much. From a miller's point of view it was worth more with the rubbish taken out of it, but something more than that was needed before they could talk about getting the biggest prices in the world. Until the last few years the general complaint farmers made was that the millers wanted to fix the standard too high. Now there was a change of front, and they were accused of fixing it too low. He did not know what the experience of other wheatbuyers was, but he could say that the firm he represented only docked less than one-quarter per cent. of the whole of the wheat they bought. For all the rest the full price was paid. The sample sent by Harrison & Co to the Corn Trade Section when the standard was being made up was taken from test samples out of every bag received up to the last day for receiving the lots at the Chamber. None of the docked wheat was put into it, so that it was actually a fair average sample of all wheat bought by the firm at top prices. The wheat came from all over the colony in large quantities, except from the districts near Port Pirie and Port Germein, and even from there, as Mr Giles knew, they got thousands of bags in some years. He had compared the firm's sample with the standard sample, and the latter was certainly not inferior, in fact they could hardly be distinguished one from the other. That went to prove that the Chamber sample was actually a fair average of the wheat that had been grown. If the farmers benefited by the teachings of Professor Lowrie and produced a better wheat the quality of the general sample would improve. They could only look at this matter from a commercial standpoint, and fixing a constant standard regardless of the quality of any one season's wheat seemed very like trying to make a man honest by Act of Parliament. No regulation they could make could compel farmers to bring their produce up to a certain point, however stringent they were. Would it not be better for farmers to do this for themselves? Every miller and merchant would be only too glad to see an improvement in the general quality, but they had to deal with the wheat as they got it.

Mr. MILLER: Good and bad mixed.

Mr. HALL: Mighty little bad in it. None went into the sample that had been docked.

Mr. MARSHALL: Does that refer to the samples sent in by the Bureau?

Mr. HALL: No; to what his firm supplied to the Chamber, and which was own brother in appearance to the standard sample.

Mr. MARSHALL: Has it not been shown that the samples collected outside were not up to the 63lbs. standard?

Mr. HALL said he was merely saying that the standard sample was almost exactly the same as his firm had actually bought, and that proved it to be an average sample of the season. It was possible, of course, to grade wheat for shipment. The point was whether it would pay to do it. Millers were always ready to pay extra for extra good samples, because they were desirous of improving the quality of their flour; but he would point out to those farmers who spoke at random of 66lbs. and 67lbs. to the bushel, that if they tried carefully, with a measured bushel, they would find great difficulty in getting any wheat to reach that standard.

Mr. MARSHALL: I sold several hundred bags this year going 65lbs. and 66lbs. to the bushel.

Mr. BLACK said the present system of preparing the standard sample was a very fair one, and he did not see how it could be improved. Each year the Chamber sent out a circular asking for "a fair sample of your district's production." They did not want all the best wheat, but a fair average from each district. The firm he represented had been repeatedly applied to for a sample, and the mode he adopted was to keep a sample bucket into which samples of perhaps 2,000 or 3,000 bags had been put. He took some from every bag received—good, bad, and indifferent.

Mr. MARSHALL: That is exactly where the unfairness comes in.

Mr. BLACK said his private sample coincided almost exactly with that supplied by the Chamber of Commerce. It showed smut, green grains, shrivelled wheat, and whiteheads.

Mr. GLEESON: Drake and oats?

Mr. BLACK: Very little drake and oats. Let anyone who had a stack of wheat sample every bag he could get at and mix the samples, and he would get almost identically the same quality as the standard. The district he lived in was one of the best and most reliable in the colony. The soil varied from heavy black to sandy soil, and there was scrub land under wheat, so that the sample was fairly representative. It would certainly be unfair to object to smutty wheat going in the sample, because the millers were also dealers, in many cases, and had to sell wheat to the shippers, who would not take a smutty sample if there was no smut in the standard. Then they could not reject all wheat that had green grains in it, because that was often unavoidable with early crops. The farmers wanted to get on with the harvest, and if the bulk of the crop was right they put the stripper in, even if there were a few green patches. If buyers refused wheat with a few green grains in it they would be constantly quarrelling with their customers. Then, if the standard was fixed too high, they would have to keep a man with a tester at work at each agency, and they would have to be very good judges indeed to judge at sight whether any particular wheat would go 64lbs. to the bushel. Almost anyone could give a very fair idea of whether wheat was 63lbs., but he defied anyone to test 64lbs. wheat with the eyesight.

Mr. GLEESON: People would soon get used to it.

Mr. BLACK: If farmers wanted to have a higher standard fixed they ought to send in better samples, and standard fixed by the section would soon be raised. So long as wheat was sent in with chaff and other dirt in it, so long would the standard remain relatively low. If it was put at 64lbs. or 65lbs. the shippers would have to have men at Port Adelaide to sample every bag.

Mr. DARLING: We do that now.

Mr. BLACK said what he meant was that there would be a No. 2 sample, and it would take a very competent judge to discriminate between 62lbs. and 64lbs. wheat straight off.

Mr. MARSHALL: It will be no more difficult to determine 64lbs. than 63lbs. wheat, as far as I can see.

Mr. BLACK: Yes, it would. It was possible to tell an extremely good sample of 65lbs. or 66lbs., but they could not always swear to that, while they could tell the ordinary average sample at once, because they were used to and had it in their eye. He felt sure it was not practicable to have two standards.

Mr. GLEESON: The Farmers' Union do it.

Mr. DAVEY said he had listened with great interest to what Professor Lowrie said, because he understood he was going to make some very strong statements with regard to the way the merchants did their business. He

believed the Professor, as a practical farmer, was doing a great deal of good in inducing farmers to take up scientific methods of agriculture, but he was somewhat disappointed with his speech, because he hoped, in addition to finding fault with the way in which the standard was arrived at and talking about the way the millers might possibly get at the farmers, he would have pointed out some way in which the fixing of the standard could be better done. Millers were only too glad to get a better quality of wheat than the average, because well-ripened and well-cleaned wheat made the best flour, and they were always anxious to improve their product if they could, so that they were always willing to pay extra for a really good grain. The Professor, while saying that he disclaimed any intention to set one class against another, said that the millers might combine to take advantage of the farmers. He (Mr. Davey) strongly deprecated any utterances which would make a rift between two classes who ought to work together in the utmost harmony, and he was sorry to say that he believed this would be the effect of certain remarks made earlier in the year by the Professor. Perhaps the Professor did not know exactly what effect his remarks would have, but they were read all over the country, and the farmers had such confidence in him that they took a very great deal of notice of what he said. He had been reading the *Journal of Agriculture* lately, and he believed it was a very good paper. He was going to take it regularly in the future, if only in self-defence, to find out what the farmers were saying about the millers. He was afraid that a great injustice was being done in the way farmers were talking about the millers and buyers in the *Journal*. If a big trust had been formed by the wheatbuyers and millers they might have the market, but of course no such combination did exist, and farmers were well safeguarded by the competition between the millers and buyers.

Mr. DARLING: The only trust existing is the Farmers' Union.

Mr. DAVEY: Yes; and he was very glad there was such a trust, and very glad there was a man like Mr. Giles at the head of it. It saved his firm a great deal of trouble, as they had been able to close a great many of their country agencies since they bought wheat through the Union. He honestly believed the farmers had got a penny a bushel too much for their wheat this season. He hoped they did not misunderstand him; he did not mean that 2s. 6d. a bushel was too much. It was a very poor price, and gave farmers a poor return, and he wished they could get a great deal more. The price was not fixed in South Australia, but in the markets of the world, and he would be very glad if the farmers were getting 4s.; it would mean bigger profits for the millers, too. What he referred to was the fact that the price of wheat locally left shippers and millers almost no margin of profit at all, and they were just keeping on to keep their staffs and plants employed. Just now if they were not absolutely losing money, the profit was almost nil, and they were simply hanging on in the hope of better times. The interests of the millers and the farmers were almost identical, and the former gave the farmers every encouragement to grow the best wheats and clean them well, and he hoped that the editor of the *Journal of Agriculture*, who was present, would see that for the future no undue suspicions were cast on a class whose interests were the same as the producers'. Wheatbuyers were sometimes sneered at as middlemen, but he would tell them that middlemen were absolutely necessary. He had said dozens of times that if the great firm of Darling & Sons was to go out of business the farmers' loss for the next three or four years would probably amount to an average of 2d. per bushel on all the wheat grown, because it would take at least that time for another firm to pick up the threads of the business. Mr. Darling had worked up a big export trade, and his long experience in this matter was of the utmost value to the farmers, because he was able to cut down expenses

to the finest point, and the farmers got the greatest benefit from this. He believed the result of the present Conference would be valuable to both traders and producers, who ought to work heartily together in the endeavor to make South Australian wheat stand high in the markets of the world.

Mr. DARLING said as a member of the Chamber of Commerce, he was very pleased to meet Professor Lowrie and the farming representatives and talk over this subject. He felt that a great injustice had been done by the publication in the *Journal of Agriculture* and also in the daily press of statements which condemned the Chamber of Commerce unheard. Now that they had met, if the farmers could show that the system adopted during the past twenty-five years of fixing the standard was faulty, and could suggest any better method, he and his friends—being sensible men—would be only too glad to adopt it. He had listened most attentively to what had been said, but so far had not heard a single argument to lead him to think that the plan adopted by the Corn Trade Section for so many years had been wrong. Had there been any such argument he would have frankly admitted it, but they must look at the question from a practical and not a theoretical point of view. Some things that seemed very nice in theory were altogether out of place in practice, and while he recognised that Professor Lowrie was, in his own line, one of the ablest men in Australia, one of the best authorities on agricultural education, and one to whom the farmers could look with confidence for advice on farming matters, he did not recognise him as a man with experience enough to be able to show traders how they could best conduct their own business. He believed that the sole object the Professor had in view was to raise the standard of Australian wheat and to get growers to clean their produce well, so that it would command the premier position in the world's markets. Unfortunately he did not stop there, and he was afraid he had listened too much to tittle-tattle without weighing carefully enough what he was told. Professor Lowrie, speaking at Quorn, had said that the standard sample as fixed by the Chamber of Commerce was considerably below the average quality of South Australian wheat, and very much below what should be the average quality. That was a very sweeping statement, coming as it did from a man like Professor Lowrie, whose words carried so much weight. The Corn Trade Section had been in the habit of fixing for trade purposes an average standard to prevent complications or unpleasantness between traders and farmers. The section was at first independent of the Chamber of Commerce, but the system was found to work so exceedingly well and gave so much satisfaction, that the two bodies became affiliated. There was some misunderstanding as to how the standard was arrived at, and some people appeared to think that the Chamber did it in a haphazard way by mixing good and bad wheat and striking a happy medium. Mr. Gleeson had suggested that wheat varying from 67lbs. to 58lbs per bushel was mixed, but that course would be quite impracticable.

Mr. MILLER: You could not get the present standard otherwise.

Mr. DARLING said they wanted the average of the season's trading sample, and not the average of the crop—good, bad, and indifferent—and they wanted a sample for which they could give a fair price to the farmers, and which they could readily sell. So if a sample of wheat going 55lbs., 56lbs., or 57lbs. to the bushel was sent in to the Chamber they did not accept it. Each district was asked to send in contributions for making up the standard sample, and those contributions, which at sight seemed to be a reasonable thing, were taken and mixed together, so that anything that went, say, 64lbs. on one side and 62½lbs. on the other were blended, and the result was a sample which fairly represented $\frac{1}{2}$ ths of our crop. The other $\frac{1}{2}$ ths formed a matter for special contract between buyer and seller.

Professor LOWRIE: Of that rejected $\frac{1}{10}$ ths, $\frac{1}{10}$ ths are represented in this standard sample.

Mr. DARLING: Certainly not. It was all put on one side. It must not be thought, either, that they took weight as the only criterion. If wheat, for instance, was badly tipped with smut, it was put out at once. Still, if all wheat slightly affected by smut was rejected, then the buyers would not be able to purchase $\frac{1}{10}$ th of the crop. As a matter of practice he believed, after many years' experience, they struck what was really a true average. If a man's wheat was only 56lbs to the bushel they made a special contract with him. If it was 66lbs. he made a special contract with the buyers; at any rate, he was a great fool if he did not. Mr. Marshall was one of the best farmers in South Australia, and he only grew the very best wheat, and cleaned it well. The consequence was that he—and rightly too—wanted a little more for his wheat than his neighbors, who did not take so much trouble, were getting.

Mr. MARSHALL: But I did not get it.

Mr. DARLING said perhaps not so much as he wanted, but he got something. Then the careful man had another advantage. Say the market was depressed, and a farmer came along with a medium, doubtful sample, the buyer would perhaps say to him he could not take it just then, while he would readily purchase a good clean grain. That kind was worth stocking in view of a better tone in the market. It was a mistake to think, as Professor Lowrie evidently did, that wheat from all the districts went into the standard sample. The Mount Gambier and Millicent wheat was never allowed to go into it, because they were temperate district wheats, and had to be bought by special contract, and it was bought and sold by sample. This was only the proper thing to do, because the wheat from the South-East was altogether different to that from the rest of the colony, and the Chamber was not going to spoil all the rest of the crop by the introduction of moist and inferior grain. It was the same in Victoria, where they had their temperate zone wheat. It was a fine full-berried wheat, but very moist, and buyers would not think of taking it at anything like market rates, while millers usually made a reduction of from 1d. to 2d. per bushel on it. While he was just as anxious as anyone to get South Australian wheat up to the highest standard, they must face the practical fact that it would not be possible to work two standards—one of 64lbs. and one of 62lbs. In this country labor was so dear that if wheat was to be dealt with to the best advantage it must be handled as little as possible. If, say, half of the crop could go right from the tail of the dray to the export ship without being stacked it meant that the buyers could give the growers better prices, because they were not incurring terminal expenses. If they had the two standards one farmer would be bringing 64lbs. wheat to an agency, and the next 62lbs. What was the agent to do? Was he to send it down to be shipped together?

Mr. GLEESON: Stack it.

Mr. DARLING had shown that it did not pay to stack, and if it could be avoided it was well to do without stacking as far as possible. There must be a fair average quality standard, and it would never do to mix grades in one ship. If they had two grades in one cargo they would create a suspicion at once in the mind of a buyer on the other side of the world. He would say, "It is a mixed cargo, and I don't care about it, but if you like I will take the lot on the basis of 62lbs. value." They did not want inferior wheats in England, and they said they could get plenty of that sort from the Argentine and other places for cheaper flour. For the better kinds they got a little choice wheat from Manitoba, a little red wheat from other parts of America, some from St. Petersburg, and some good white wheat from Australia, and they did not want our, second quality grain. He said advisedly, after thirty-four years' experience in the grain trade, that if they went in for the two

samples it would be the biggest mistake they ever made. If they did not ship the two standards in one vessel they must stack, and that meant expense. They could not stack at a cost of less than about three farthings a bag in and three farthings a bag out, or three halfpence in all, so they could easily see the disadvantages in this. The best plan was the present one of fixing a standard which fairly represented seven-tenths of each season's crop, and with that most of the product was handled without trouble. Professor Lowrie, at Quorn, suggested that it was possible for a shrewd business man to put in two-thirds of a cargo of 64lbs. wheat and fill up the remainder with 62lbs. quality, thereby creating an average of 63lbs., and making a good deal of profit by having docked the farmers on the lighter quality and paid no more than standard value for the other. Professor Lowrie was, in making that statement, really questioning the integrity of the shippers and millers of South Australia, and there was nothing to justify his statement in any way. To his knowledge that sort of thing had never been done, and certainly his firm had never done it. If it was done it would be certain to be detected, because it must not be forgotten that there were as keen men of business in other parts of the world as in South Australia. They would be certain to sample such a mixed cargo, and the samples would be compared with the f.a.q. sample in London. Then if it was found that there was 64lbs. wheat in one part of the ship and 62lbs. wheat in another, the matter would be submitted to arbitration, and the shipper would be mulcted in damages and have to pay the cost of the arbitration proceedings besides, and also the sampling charges. If a shipper were foolish enough to try it on once he would not be likely to repeat the experiment, it would cost him too dear. If they were going to have the two standards suggested by the Professor, the only practical way would be to have an elevator at the port of shipment and thoroughly blend the two kinds into 63lbs. wheat.

PROFESSOR LOWRIE: In taking a sample for arbitration is the unit bag considered?

MR. DARLING: Undoubtedly.

MR. MILLER: In 1897-8 the standard was 62lbs. Did you separate that wheat from the 1899 wheat?

MR. DARLING: We are judged by the merits of the sample each year.

MR. MILLER: But you make up the sample afterwards.

MR. DARLING: The sample is made up after the season begins, undoubtedly.

MR. MILLER: The standard in 1898 was 62lbs. In 1899 it was not fixed till a large quantity of the new season's wheat had been bought. I am told that the latter—heaps of it—was bought on the 62lbs. basis and sold by the buyers at 63lbs.

MR. DARLING: You are quite mistaken. The 1899 wheat was bought at 63lbs.

MR. MILLER: You recognise that the standard was not fixed until a large quantity of the new wheat was bought?

MR. DARLING said they knew whether the wheat was likely to be better in the coming season long before the standard was fixed. Even the first few dray loads gave them an idea of the new crop, and they got the sample fixed up as quickly as possible. He would like to say, also, it was news to him that a large quantity of South Australian wheat was, as Professor Lowrie said, sold in London before it was reaped.

PROFESSOR LOWRIE: I did not say that.

MR. DARLING: Professor Lowrie was reported with having said, "Much South Australian wheat—he could not say how much—was sold in London before it was bought here."

PROFESSOR LOWRIE: That is correct; the other statement was not.

Mr. DARLING said he thought he was in as good a position to know as anyone, and he said there was no truth whatever in that statement. There was very little South Australian wheat sold in London before it was bought, because as a rule American tactics were not those of Australia. There were no call-boards here, and he was glad to say Australians did not gamble in wheat. That being so, the Professor's statement must be wrong. He did not think Professor Lowrie would knowingly make an incorrect statement likely to do anyone damage, and he hoped he would accept the assurance that no such practice existed. Personally he would like to see the standard raised to 64lbs., but if it was raised, he hoped the farmers would not blame the traders for the consequences.

Mr. MILLER: If you have a 64lbs. standard you must have a lower one as well.

Mr. DARLING: You would like to have the two?

Mr. MILLER: Yes, if it is practicable.

Mr. DARLING supposed that 64lbs. was the highest standard they could take with safety. The present standard was 63lbs., and he hoped they did not think the cash difference between them would be very great. Professor Lowrie, he believed, had stated that the lowering of the standard from 64lbs. to 63lbs. had caused a loss in the English markets of probably about 1s. 6d. to 2s. per quarter. Was that right?

Professor LOWRIE: I said 2d. a bushel.

Mr. DARLING: That was 1s. 4d. a quarter. He thought the Professor would agree that 65lbs. would be too high.

Professor LOWRIE: I do not think it would be too high, but I believe there would be considerable opposition to it. It is the standard at which we should aim, and we can reach it all right.

Mr. DARLING said the impression raised by the statement of Professor Lowrie was one that the farmers were justified in being considerably alarmed at. Last year's crop was 8,453,135bush.; deducting 1,453,135bush. for seed left 7,000,000bush., or 875,000qrs. So that if the loss was 2s. a quarter it was £87,500 for last year alone, or £65,625 at 1s. 6d. per quarter. He did not think for a moment that Professor Lowrie thought that such a thing as that had occurred.

Professor LOWRIE: Yes, I do.

Mr. DARLING: Roughly, wheat was worth last season 2s. 6d. a bushel, or a halfpenny per pound, so on that reckoning the difference between 63lbs. and 65lbs. wheat would be a penny a bushel on the whole crop. Still, what they lost in flour in the lighter sample they must gain in something else, and so there was more offal. Reckoning, therefore, the bran, &c., they got back, the loss was reduced to a farthing per bushel, or £7,291 16s. 8d. on the whole crop, instead of £87,500 as Professor Lowrie's statement at Quorn indicated. That gentleman's arguments were entirely erroneous and misleading. The intrinsic value of 65lbs. wheat was, as he had proved, only a farthing a bushel greater than 63lbs. grain. It had been suggested that there were opportunities for fraud on the part of wheatbuyers under the present system. Did they not think these opportunities would be greater if a double standard was established. There would be no Government supervision and no check at all on the shipper at this end. What was to prevent a dishonest merchant shipping No. 2 as No. 1.

Mr. GLEESON: Mark the bags.

Mr. DARLING said that would be impracticable for many reasons, and they would have to rely on the honesty of the traders, though, as he had pointed out, he did not think a dishonest shipper would last more than one year. As he had shown, the intrinsic difference between 63lbs. and 65lbs. wheat was

about a farthing a bushel, or £7,000 for the crop. Did they not think that the extra expense caused by having two standards would be more than that? Then what were they going to do with the remaining portion of the crop that would not go 62lbs.? Some parts of the colony were susceptible to rust and smut. He had seen some of the heaviest and best grain almost as black as his hat; what would they do with that? Would they grade it?

Professor LOWRIE: Certainly not; it is outside the pale.

Mr. DARLING: It would have to be sold by special contract. In fact, of the whole crop only one-tenth probably would be 65lbs. to the bushel, and the traders would be doing the farmers a most serious injustice if they made the highest standard one which would only take in one-tenth of the crop.

Mr. MARSHALL: The standard can be easily raised by better cleaning.

Mr. DARLING said if the farmers really wanted this 65lbs. standard he would be delighted to give it to them, only they must not blame the merchants if they found the thing did not work out as they expected. A man who had a nice farm, well tilled and well cultivated, and could grow cleaner wheat than his neighbor, whose land was not so advantageous, and the labor cost of putting the grain three or four times through the winnower would not be compensated by the extra price obtained. He would be only too delighted, in the interests of South Australia, to see the standard of the colony's wheat raised, but there was really no such crying need for it. The present standard was a standard for white wheat, which was equal to any in the world for trading purposes. They could see by the samples on the table that South Australian wheat was much better than New South Welsh, and even a little better than Victorian. A South Australian cargo would command the preference over a Victorian.

Mr. MILLER: How much extra money?

Mr. DARLING: It would command the preference. It was only heavier by 1lb. per bushel, a difference which would hardly be recognised in the market. If they raised the standard higher than it is at present they would simply be penalising the farmers without any compensating advantage. The buyers in the world's market would practically say "We were quite satisfied with your wheat, and don't want anything better." Another point of considerable importance was the difficulty of keeping up a supply of high-grade wheat. If they sent a few cargoes of 66lb. wheat, and the buyers could get no more, that class of grain would be at a discount. The millers in England would, as a rule, give Australian wheat the preference to San Francisco or Argentine wheat; but if they got the high class 65lb. or 66lb. wheat they would just get their mills set to suit it when the supply would run out. The consequence of the limited nature of the supply of No. 1 wheat would be that the millers would not look at it because they want a constant supply, and so the No. 2 wheat would become the standard sample, to the very great detriment of the farmers. He thought that he had shown very good reasons for retaining the present system.

Mr. HAGUE did not think he need say much after Mr. Darling's explanation. He recognised that Professor Lowrie was actuated by the very best motives in trying to improve the quality of the wheat and getting the best price for it for the farmers, but his views would probably be materially altered if he took the place of a country wheatbuyer for a few months in a dry season. In former years the grumble made by the farmers was that the standard was fixed too high, and his experience was that the wheatbuyers had great difficulty in reaching the present standard. Samples going 58lbs. or 59lbs. were constantly coming in, and their difficulties would be greatly increased if the standard was put up to 64lbs. A specially good sample always commanded a high price from the millers, and from the dealers also, because the latter knew they could always sell it to the millers to mix with inferior lots.

The CHAIRMAN said that as representing some 3,000 farmers, and having no interest in the subject outside of theirs, he would like to say a few words. At first there seemed to be a great deal in the contention of Professor Lowrie, but when he came to think it over, and listened to the other speakers, he saw at once the thing would not do when it came to practical working. The great difficulty the Farmers' Union had was to get their agents—they had about sixty of them in all parts of South Australia—to keep up to the 63lbs. standard. In all the northern districts this year the Union had got a lot of 62lb. wheat; they had to take it to please their shareholders. They even had to make a third sample, but they refused to take any liability over it. They did the best they could with it, but at the farmers' risk, and when they had got a parcel of it they sold it for fowls' wheat. As much as possible he kept the 63lbs. and the second-grade wheats apart. At that very time he had a vessel going to Port Augusta to load a cargo of 61lb. and 62lb. wheat, which would be sent to the old country and sold on sample. The disadvantage of dealing with that sort of wheat was that it could not be sold till it arrived at its destination, whereas standard sample wheat could be sold while still on the water. No doubt the millers would like to see the standard raised permanently to 64lbs., but, as Mr. Stone knew, some of the dry districts on the west of the Flinders range rarely reached that standard. There was a large portion of the colony which could never reach it, no matter how favorable the season.

Mr. MILLER: What is the standard in England?

The CHAIRMAN said that was a different wheat altogether, and comparison with our conditions was futile. The Union had a fortunate experience not long ago when they shipped a second grade cargo, and happening to strike a good market, got as much for it as for the standard wheat. That was exceptional, however. He agreed with Mr. Darling that if they had too many standards the cost of handling would be too great to allow of any extra profit on high quality grain. It was as much as the Union could do to get an average of 62lbs. or 63lbs. for the top quality. In sending in contributions for the making up of the standard sample the Farmers' Union never sent in any poor wheat. Each year he sent out to his agents and asked them for fair average samples from their first-grade stacks. Complaints had been made about docking, but as the buyer could not sell 61lb. or 62lb. wheat as readily as the standard he had to stack it, and that meant extra expense, and so he must dock to recoup himself. He thought 63lbs. was quite high enough for last season, and he would not have liked to see it raised. Certainly there was some smut in the sample, but it was a very good thing for the farmers that there was. The Farmers' Union bought over 200,000 bags of last season's wheat, and a large amount would have had to be docked if there had been no smut in the standard sample, because a large quantity of the wheat grown had smut in it. It might have been better if Professor Lowrie, before he said so much on this subject, had asked the secretary of the Chamber of Commerce or some member of the Corn Trade Section how the standard was arrived at, and then he would have been in a better position to approach the subject.

Mr. DARLING said they had met for the purpose of discussing the method adopted by the Corn Trade Section of the Chamber of Commerce in fixing the standard. He would now formally move—"That this Conference approves of the course adopted by the Chamber of Commerce in fixing the standard sample of wheat for trading purposes." That in no way interfered with Professor Lowrie and the Agricultural Bureau in educating farmers up to supplying a better sample.

Mr. HAGUE seconded.

Mr. MILLER moved, as an amendment—"That it is undesirable, in the interests of the farmers, that the standard should be varied every year." They

had just learned from Mr. Darling that the intrinsic difference in value between 61lbs. and 62lbs., with wheat at 2s. 6d. per bushel, was $\frac{1}{2}$ d. a bushel. That showed the futility of varying the standard by $\frac{1}{2}$ lb. They were told that only wheat bought without deduction was allowed to go into the standard. If that was so he did not see how they ever got it down to the previous year's standard. If none worse was put in there must be a lot of better, and so the standard would go up each year. It would be infinitely better to have a fixed standard of 63lbs., and then farmers would know what to expect. At present the standard for the season was not fixed until a large proportion of the season's wheat had been delivered in the earlier districts. He had previously shown how little the standard had varied in the last ten years, and he believed in previous years it was even more constant.

Mr. DARLING: About the same.

Mr. MILLER: Then the benefit they got from altering the standard yearly was not worth the trouble.

Mr. DARLING asked if Mr. Miller could tell to $\frac{1}{2}$ lb. what wheat weighed, by sight?

Mr. MILLER: No. Do your buyers buy by sight?

Mr. DARLING: Yes.

Mr. MILLER did not think so. At any rate, they docked a good deal more than $\frac{1}{2}$ d. per lb. for wheat below the standard.

Professor LOWRIE seconded the amendment.

Mr. DARLING pointed out that with the expenses of stacking it would probably work out at a penny. Nine-tenths of the wheat was bought by sight, and at the opening of the season the agents accepted any fairly good wheat which looked like going 63lbs. or 64lbs. If a sample was badly tipped with smut, or was very light, say 57lbs. or 58lbs., they did not send it down. He remembered that one of the Bureaus sent a sample which was only fit for fowls' grain, and it was of course not put in.

The CHAIRMAN said that Mr. Miller had spoken of one year running into another. The Union on one occasion had a large quantity of wheat over, which had been bought at the top price the previous season. They did not mix it with the new wheat, but sold it as second grade at a big reduction. This was at Yongala, where the Union had a good big stack of it. He took good care that he did not hold over any inferior wheat, but if he could he liked to have some really good wheat on hand to sell to the millers for mixing purposes early in the year. He would like to know if Mr. Miller wanted the standard fixed at 63lbs.

Mr. MILLER: I do not say that, but I think it would be a fair average.

Mr. DAVEY: You will get a theoretical standard instead of a practical one. The Chamber of Commerce fixes as a standard a sample of what is actually grown.

Mr. MILLER: It will only be a standard for the best wheat.

Mr. DAVEY: The season may alter.

Mr. DARLING said he would state plainly that if a constant standard was adopted he for one would not recognise it. He would be very sorry if, when a new season opened and the crops happened to be badly rusted, he had to cable to England that the crop would not reach the constant standard. It would be a very bad advertisement for the colony, and he could see that if Mr. Miller's proposal was adopted the merchants would be able to make a pot of money at the expense of the farmers.

Professor LOWRIE said he believed Mr. Miller's motion was putting into words the idea that the standard No. 1 South Australian wheat should be 64lbs. of clean wheat, as the trade understood the term "clean wheat." The present method of fixing the standard was irregular and haphazard. There

might be something like six agents in the Middle North, sixteen in the areas districts, and five in the Far North, and the sample was governed simply by the district where the majority of the agents were. It had been said that it was the farmers who had the matter in their own hands, but as long as the standard was fixed at 63lbs. they would never get any better, and as long as they allowed indifferent wheat to be put in it would never improve.

The CHAIRMAN: You educate your farmers up to growing a better class of wheat and a better sample will come to the Chamber of Commerce.

Professor LOWRIE said he thought he might ask it to be supposed that he was a better farmer than some, and could turn out a good article if he wished, but if he was not going to get any more for wheat which went 65lbs. than for 53lbs. he could hardly be blamed if he mixed in some cocky chaff to bring it down to the lower weight. Mr. Darling knew that South Australian wheat was snapped up as soon as it was offered.

Mr. DARLING: I wish it were so.

Professor LOWRIE: It is good wheat.

Mr. DARLING: And you want to make it better.

Professor LOWRIE said we did not make the most of the conditions of our dry climate. If Mr. Miller would withdraw his amendment he would move the following:—"That the Chamber of Commerce adopt a South Australian No. 1 sample, and that the sample be 64lbs. to the bushel of clean wheat, constant and determined from year to year."

Mr. MILLER said he had no objection to withdraw.

Professor LOWRIE then moved his amendment, but it was not seconded.

Mr. DARLING said that from a scientific point of view he was with Professor Lowrie. If it was possible to maintain a constant supply of 64lb. wheat he would be entirely in favor of the proposal, but it was altogether impracticable. In the interests of the colony such a standard would be a good thing, but he was certain it would mean disaster to the farmers. If a bad season came along, and the buyers in England heard there was a chance of the standard not being maintained, they would simply say, "We will not buy any South Australian wheat until we see the sample."

The CHAIRMAN said, representing as he did a large number of farmers in the dry outside districts, he could not agree to having the standard fixed so high. If the proposal made by Professor Lowrie was adopted no doubt the 64lb. standard could be reached in the Lower North, but it could not in the dryer districts.

Mr. HALL said samples would have to be sent to England. What would they arbitrate on in case of a dispute?

Mr. DARLING: You would have to deposit a sample equal to 64lbs., and they would arbitrate on that.

Mr. BLACK agreed with Mr. Darling that it was a very nice theory that Professor Lowrie advocated, but it would not work out in practice. He would be pleased to always receive 64lbs. wheat, but it was not to be done. Many farmers cleaned their wheat well, and they got special prices for it.

Professor LOWRIE said a bogey had been raised that was not likely to occur. The lowest sample in ten years had been 62lbs., and there was little of that wheat which could not have been cleaned up to 64lbs. by an extra winnowing. Such of the wheat as could not be cleaned up—the shrivelled grains and so on—could be dealt with as at present. Two qualities or more could be done in India and other countries, and he did not see why it should not be done in South Australia. At present one out of every forty-five farmers was working for the man who stacked the wheat, and surely the latter could afford trouble.

Mr. GLESON said the Farmers' Union had shown that it was quite practicable to take two classes of wheat, and he would very much like to see

the grading system established. He suggested that the merchants should not ship until they had a shipload of one grade ready to go.

Mr. DARLING remarked that if they went on that principle they would soon be in trouble. Ships had to be chartered months ahead, or they would be cornered, and could not get them.

Mr. GLEESON explained that what he meant was that the two standards should be kept separate for shipping.

Mr. Darling's motion was carried by 5 votes to 4. Messrs. Gleeson and Molineux did not vote.

Mr. DARLING said the traders were exceedingly glad to have had the opportunity of meeting the farming representatives. If at any time the interests of the two classes appeared to be in conflict, he and the other traders would be only too glad to hold a further conference, so as to clear away any uncertainty which might exist. There were many points which might cause misunderstanding. One such in the past had been with regard to the gross weight of bags. Then again he had heard farmers ask why they should give 63lbs. to the bushel and only get paid for 60lbs. They did not really understand, some of them, the position with regard to this matter. In connection with any such matter the Chamber of Commerce would be pleased to meet the Agricultural Bureau in conference. He hoped the result of the present meeting would be such as to clear away any misunderstanding which might have existed on the standard bushel question, and he recognised that both bodies were equally animated with a sincere desire to do what they could to improve the products of South Australia and obtain better markets for them.

Mr. MILLER said it was only right that the views of the farmers should be considered in the fixing of trade regulations, and he was grateful to the Chamber of Commerce for meeting the farming representatives, and for affording facilities for the meeting. He had not been aware that any farmer was so simple as to make the absurd mistake about the weight of wheat per bushel, as Mr. Darling said. He agreed with that gentlemen, however, that the conference would result in good, and that it was to the interest of the traders and farmers to work harmoniously together for the benefit of the agricultural industry. He had much pleasure in proposing a vote of thanks to Mr. Giles for presiding, and to the Chamber of Commerce for the ready way in which they had agreed to confer.

Mr. MOLINEUX, in seconding the motion, said on behalf of the Bureau he would express his gratitude to the Chamber for meeting them in conference. He hoped the meeting would have the effect of clearing away any cloud which existed, though he could hardly say it was cleared away yet. A reporter was present on behalf of the Bureau, and he would supply an almost verbatim report of the proceedings for publication in the *Journal of Agriculture*. This would be read by the members of the Bureau, and would, no doubt, assist to clear the air. Mr Davey had spoken of injurious statements published in the *Journal of Agriculture*, but if he had seen some of the statements which had been sent in and subjected to a judicious sub-editing, or not published at all, he did not know what he would have said. He did not like to hurt the feelings of anyone, but it was necessary for an editor sometimes, like a skilful surgeon, to use instruments which were sharp and give some pain in order to cure an ailment.

The motion was put by Mr. Molineux and carried, and the conference ended.

WATERPROOF GLUE.—Soak common glue in water until it softens, but remove it before it loses its original shape. Then dissolve it in linseed oil over a slow fire until it becomes like jelly. It is then ready to join any substances together, and will resist the action of water.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, AUGUST 20, 1900.

Present—Mr. F. E. H. W. Krichauff (Chairman), Sir Samuel Davenport, K.C.M.G., Messrs. W. C. Grasby, Thomas Hardy, M. Holtze, R. Homburg, M.P., H. Kelly, T. B. Robson, and A. Molineux (Secretary).

Congress.

The SECRETARY reported that the Exchange Room at the Adelaide Town Hall had been hired for the Congress meetings. Owing to the opening of the South Australian Farmers' Co-operative Society's new buildings being fixed for the Thursday evening it was not advisable to hold a Bureau meeting on that evening, so many members being interested in the other engagement. The opening meeting of Congress would take place on Tuesday, September 11th, at 2:30 p.m. The Hon. Minister of Agriculture had agreed to open the proceedings.

Mr. HOMBURG referred to the question of rail fares of delegates to Congress. It seemed hardly fair that those Branches near lines of railways should be provided with free tickets for two delegates while the members of many Branches had to pay their own fares, simply because they could not avail themselves of the railway when travelling.

Other members agreed, while the Secretary pointed out that in the case of the railway it was actually no additional expense to the public funds to carry a few delegates free, but with coach and steamer fares it would mean a considerable expense. Mr. Homburg said it was too late to do anything in the matter this year, but he would bring it forward again next year.

Bute Field Trial.

Mr. GRASBY reported having, in company with the Inspector of Fertilisers, attended the recent field trial of agricultural implements and show of stock in connection with the Northern Yorke's Peninsula Bureau Field Trial Society at Bute. He regretted, however, to say that as a field trial of implements the affair was a failure, the principal manufacturers and importers of agricultural implements having combined and agreed not to take any part in such affairs, as well as in most of the agricultural shows.

Winter Irrigation.

The SECRETARY reported that the work of laying on the water to the two plots to be used for experiments in the effect of winter irrigation of fruit trees and vines would be commenced almost at once.

Mr. GRASBY said a slight misapprehension existed in regard to the object of the Bureau in this matter. It had been objected by outside people, some being gentlemen of considerable standing, that it was ridiculous to attempt to make irrigation pay with water at 6d. per 1,000galls. He thought, therefore, they should make it clear what they hoped to demonstrate in these experiments. It had on several occasions been stated that the Bureau did not in any way suppose it would pay to use water either for summer or winter irrigation at 6d. per 1,000galls. The question of cost was one which they did not need to concern themselves about at present. Their object was to demonstrate the effects resulting from giving the soil a thorough soaking in August, to provide the trees with moisture during the summer months. When that had been done it was for the individual grower to determine how he could obtain the

water, if desirable, and what price he could afford to pay for it. In many cases it would be quite unnecessary to obtain water either by pumping or from the mains, as local flood waters could be diverted on to the land.

Standard Weight for Chaff.

The Hon. MINISTER intimated that the question of having a legal standard weight for the bag of chaff as advocated by the Bureau would receive further consideration.

Licensing of Bulls and Stallions.

Mr. HOMBURG called attention to the question of licensing stallions and bulls offered for hire. The matter had been frequently discussed at the Bureau meetings, and the necessity for veterinary examinations of travelling stallions admitted. The principle was the same whether applied to horses or cattle. Mr. Livingstone had a motion before the House of Assembly dealing with the licensing of stallions, and he believed it opportune for the Bureau to again move in the matter.

The SECRETARY said a majority of the Branches had expressed themselves in favor of the veterinary examination of stallions whose services were offered for hire, but a number objected on the ground principally that it was "interfering with the liberty of the subject." Members failed to see how this could be, as it was simply proposed that no one should accept a reward for the services of any stallion unless it was certified to be sound by a qualified authority. If anyone wanted to keep inferior animals for his own use there was nothing to prevent him doing so.

Mr. HOMBURG moved that the Hon. the Minister be advised that the Bureau has passed the following resolution—"That provision should be made in the Local Government Bill now before the House authorising municipal corporations and district councils to prohibit the use for reward of unsuitable stallions and bulls for stud purposes." This was seconded by Mr. Grasby and carried.

Codlin Moth Caterpillars.

Mr. GRASBY said that a few days ago Mr. Rossini, of Upper Sturt, told him that in the winter of 1899, by accident, a few bandages were left on some apple trees when the others were removed in May. Later on, one of his sons noticed them and on examination found a number of grubs. He reported the fact and during the winter several examinations were made, and it was found that after very wet or very cold weather a fresh lot of grubs was always to be caught. Acting on the hint, he has allowed the bandages to remain on all the trees, and has examined them each month with the same result. From about six acres of apple and pear trees he has collected over 1,000 grubs since May. He is convinced that the grubs take refuge in the ground, but are driven from there and seek shelter under the bandages in bad weather. He is of opinion that the regulations require amending, to provide for keeping the bandages on all through the winter and for the examination of the trees at intervals. In spring all rotten bandages should be removed. If this be done and the fruit houses are attended to, the pest will be greatly reduced.

It was decided that Mr. Rossini be thanked for calling attention to this matter and be asked to report further on his experience.

Plants from Botanic Gardens.

Mr. HOLTZE said, on several occasions he had offered certain plants for free distribution through the Bureau, but a good many applicants seemed to expect him to provide packages and pay cost of carriage. He wished it to be

distinctly understood that when any plants of economic value were available applicants must arrange to obtain them from the Garden at their own expense.

Conference at Cherry Gardens.

The Cherry Gardens Branch advised that the fifth annual Conference of Hills Branches would be held at Cherry Gardens on October 4th.

New Branches.

Approval was given to formation of a Branch at Rhine Villa, about thirteen miles from Mount Pleasant, with the following gentlemen as members :—Messrs. A. Payne, J. Vigar, G. A. W. Schick, John Evans, J. McConnell, H. Mickan, H. Payne, C. Groth, H. Moody, H. Seidel, and H. Modistach.

Application to form Branch at Pellaring Flat could not be granted owing to proximity to Mannum, only seven or eight miles distant. Members pointed out that in such cases the Branch should make it widely known that visitors were invited to the meetings. Notices of place and time of meeting should, when possible, be posted in prominent place.

New Members.

The following gentlemen were approved as members of the undermentioned Branches :—Renmark, Messrs. C. L. Willis; Clare, Mr. S. Smith; Yorketown, Mr. A. Anderson; Arthurlton, Mr. Wm. E. Hawke; Port Broughton, Mr. E. Gardiner; Dawson, Rev. C. Doley and Mr. J. H. L. Severin; Morphett Vale, Mr. E. Perry; Paskeville, Mr. J. P. Pontifex; Wilmington, Mr. F. Bauer; Gladstone, Mr. J. Buiton; Mannum, Mr. J. W. Haly; Swan Reach, Mr. McDonald Lange; Mount Compass, Mr. A. Cameron; Lipson, Messrs. Caleb Provis, H. Brown, and J. Wishart; Forest Range, Messrs. Job Rowley, and J. C. Jennings; Norton's Summit, Mr. Herbert Horsnell; Pine Forest, Messrs. W. Kempster, and W. C. Cooper.

Reports of Meetings.

The SECRETARY reported receipt since previous meeting of 108 reports of Branch meetings.

REPORTS BY BRANCHES.

Morphett Vale, August 1.

Present—Messrs. L. F. Christic (chair), J. Bain, A. Jones, T. Anderson, J. McLeod, F. Pocock, G. Goldsmith, and A. Ross Reid (Hon. Sec.).

VINE-PLANTING.—Mr. T. Anderson read the following paper :—

Selecting and Planting Cuttings.—It is always advisable to root the cuttings if possible one or two years before planting out. Two-year-old rooted vines come into bearing a little sooner than those one year old, but well-grown yearling vines are most likely to take, and they are a good deal easier to lift and plant. When selecting the cuttings, always choose those perfectly sound and free from oidium, black spot, &c, choosing those of medium size of one year's growth. Cut them straight across at the bottom, close below a bud, and have them about 12in. or 14in. long. Plant them in a moist place sheltered from drying winds, where they can, if possible, be irrigated in summer, but avoid places from which the water cannot drain off, or the cuttings may rot. A quick and easy way of planting cuttings is to get a single-furrow vineyard plough and a strong steady horse, and by going along twice in the same place a furrow 8in. or 9in. deep can be ploughed: then plant the cuttings in every third furrow, pushing them into the side of the furrow to the bottom, so as to be held firm in place before the next furrow is turned, after which walk along with one foot each side of row, pressing the soil firmly around the cuttings and cutting off any that are more than two buds above ground; then rake over with a garden rake. The ground will need to be kept free of weeds and the surface loosened occasionally.

Preparing Land for Planting.—The land should be either fallowed or ploughed early in the season, soon after the first rains, to a depth of at least 6 in. if the surface soil is deep enough, but the clay subsoil should not be turned up. The land should then be worked down as fine as possible, and all weeds destroyed. Just before planting run a subsoil plough through the land to a depth of at least 8 in., especially if the surface soil is less than 6 in. or 8 in. deep.

Planting.—A piece of No. 10 hard steel wire which will not stretch is best for marking out the ground for planting. Run the wire along one side of land to be planted and pull it very tight; then mark the wire the distance apart you want the vines. A piece of string tied tightly around the wire and then painted over with thick paint and left to dry makes a very good mark, which will not easily shift. Then drive a peg in at the last mark at each end. Then go to opposite side and mark it out the same way, driving a peg at each corner. Then run wire opposite way from one corner peg to peg opposite, and plant one row, doing the same at the opposite side, which will give the two ends of each row. Then drive a peg firmly into the ground about 3 ft. behind and 4 in. to the side of end vine, to which fix the wire and pull it straight to the vine on the opposite side, so that the first and last marks on wire are exactly opposite each end vine. Then dig holes opposite each mark about 8 in. deep and the same in width with spade, and loosen up the bottom of hole with a digging fork. Before planting prune the vines and cut off any damaged roots with sharp clippers. Then plant 4 in. from each mark on wire, being careful to cover the roots with fine soil, filling the hole about three parts full; then dig around the vine, filling up the remainder of hole and leaving a shallow trench around the vine. The roots of the vines should not be allowed to get dry before planting. The vines should be planted as soon as possible after being taken up, and should be covered with a wet bag until wanted.

Hahndorf, August 4.

Present—Messrs. A. von Doussa (chair), T. H. Sonnemann, C. Bom, H. Kerr, W. Liebelt, J. C. Rundie, D. J. Byard (Hon. Sec.), and one visitor.

SEED EXPERIMENTS.—Mr. Kerr said the climate here was too cool for the Cow pea. Other members said Kleckley sweet melon was very large and good; Hungarian Honey sweet melon bears good crops of small sweet fruits; Iceberg lettuce was excellent, and is good for both winter and summer cropping in this locality.

CODLIN MOTH.—This pest is present here. Mr. Kerr said no effectual check can be put upon it until more care is taken with the storage rooms. These rooms should be built close enough to allow of thorough fumigation. He had found hundreds of codlin moth caterpillars at the junction of the walls and the plastered ceiling. These would be effectually protected during the winter, whilst those in the open were subject to the weather as well as to the attacks of birds, predaceous insects, and other enemies. Very little attention was paid to prevention of escape of moths from the storehouses.

Brinkworth, July 5.

Present—Messrs. S. Auger (chair), A. L. McEwin, G. Wooldridge, A. W. Morrison, C. Ottens, J. F. Everett, W. Welke, J. H. Welke, W. H. Pearce, W. Wundke, J. Stott (Hon. Sec.), and three visitors.

QUANTITY OF SEED TO SOW.—Mr. McEwin read a paper on "The Quantity of Wheat to Sow per Acre," to the following effect:—

It is an old custom to sow from 1 bush. to 1½ bush. of seed wheat per acre, and through this custom thousands of pounds sterling are annually thrown away. He had always practised thin sowing, and obtained crops above the average of the neighborhood. Last year he drilled from 30 lbs. to 45 lbs. seed per acre, and the 30 lbs. of seed gave the best crop; but that was sown earlier and was not pickled. Pickling undoubtedly destroys a good quantity of seed. All those members of this Branch who sowed Petatz Surprise wheat at the rate of about 30 lbs. per acre reaped from 12 bush. to 15 bush. per acre from it. He sowed 60 lbs. of it on one and three-quarter acres on May 28, and reaped 28½ bush. good clean wheat. At same time he sowed 45 lbs. per acre beside it, and yet the thinly-sown crop had the best heads and yielded most wheat to the acre. Now, an acre of ground contains 43,560 sq. ft. of surface; a bushel

of wheat contains from 600,000 to 700,000 grains, say 600,000. This would give fourteen grains for 1 sq. ft. of surface. Where there has been sufficient space single plants of wheat have been known to stool out and produce upwards of 100 well-developed heads; but from three to six heads would not be an extravagant number to expect. Suppose only $\frac{1}{2}$ bush. of seed to be sown to an acre; this would give seven grains to the square foot, each grain producing three heads, each head containing twenty grains of wheat. This would give a return of 30 bush. per acre, estimating 700,000 grains to the bushel of seed, or 25 bush. on a 600,000 basis. These facts ought to convince most people that less seed than is usually sown would give better results. It would never pay a gardener to attempt to grow vegetables as a farmer grows his wheat. If farmers could arrive at a knowledge of what is the most profitable quantity of wheat to sow per acre, they would derive great advantage from it. He wished each member of the Branch to try twenty acre plots with 30lbs., 35lbs., 40lbs. and 45lbs. of seed per acre, under similar conditions, and harvested cleaned, and weighed separately. There should be little trouble and difficulty in doing this, as the seed drill can be so perfectly adjusted to sow regulated quantities per acre. He had paddocks sown this season with 33lbs., 40lbs., 45lbs. and 50lbs. seed per acre, and would like members to inspect them. For early sowing he advised 35lbs. of good stooling wheat; for later sowing he would put in 40lbs. and 5lbs. more for quickly-maturing sorts. With 7in. hoes on the drills 40lbs. seed would place the grains at 2in. apart.

Most of the members agreed with Mr. McEwin. Mr. Ottens would sow Steinwedel and Early Para a little thicker. Mr. Everett had always got good results from thin sowing. Mr. Wundke thought early-sown wheats malt in the ground, and this causes the crop to be thin.

Holder, July 28.

Present—Messrs. F. A. Grant (chair), J. Rossiter, F. G. Rogers, W. Watt, J. E. Trimming, E. Crocker, E. Jaesche, J. Rowe, J. Maddocks, J. J. Odgers (Hon. Sec.), and two visitors.

BULLS.—The Branch favors subsidy of £1 for each £1 raised by subscription for purchase of pure-bred dairy bulls for use in any district, and think the principle should be extended to stud animals generally.

PAPERS.—The Chairman promised to prepare a series of papers descriptive of farm animals, to fill up gaps when members fail to fulfil engagements to provide papers. [If each member of every Branch would carry a small memorandum book and pencil, and between the latest meeting and the next note down everything coming under his notice or into his mind that would be of interest or of use to his fellow members, there would never be any lack of subjects for discussion at Branch meetings, nor would there be any failure of active interest in the proceedings at the monthly meetings. Please consider this recommendation at next meeting of each and every Branch of the Bureau.—GEN. SEC.]

Quorn, August 2.

Present—Messrs. R. Thompson (chair), J. B. Rowe, Jas. Cook, F. Herde, G. Altmann, C. Patten, W. Toll, J. Rock, and A. F. Noll (Hon. Sec.).

PAPER.—Mr. J. B. Rowe read a paper entitled "Suggestions for the Improvement of this Branch." The following is a condensation:—

As I have been connected with this Branch since its formation, and have noticed the varied interest taken in the monthly meetings, I have often thought there should be certain rules fixed by a committee consisting of members of this Branch for the guidance of members attending the meetings. As the Branch is now conducted the members are in the habit of attending the meetings very irregularly, which is most undesirable in the interests of this or any other Branch. To make the Branch a successful one, individual members should take greater interest in the meetings, by endeavoring to bring forward at each meeting in turn a subject for discussion, or a short paper on a given agronomical subject, that would create a discussion which would be of interest, and be subject matter for each meeting. The tendency

of members as a rule is to depend too much on the correspondence from the Central Bureau for matter to carry the meeting on. In adopting this individual effort a far greater amount of self-reliance would be engendered, and each member would soon become accustomed to take his turn in the order that is appointed by the committee. I would suggest that a plan be prepared by the secretary or a committee, setting forth all the names of the members, and each member be appointed to read a paper or bring forward at each monthly meeting a subject for discussion, or, in default, a written apology, or if not sufficient excuse being made to the meeting for his absence, a fine of half-a-crown be imposed, and the amount be placed in a fund for the purchase of books that shall form the nucleus of a library for the benefit of this Branch. Another point that I think would exert an influence in this locality would be the united efforts of the members for the purchase of pure-breed bulls of the milking strain for use in the district. Pure-breed pigs should be purchased; the very best breed of poultry, that is the most profitable for the farmer, and any animals that this Branch thinks desirable and has the means to purchase; also combined action in holding field trials of agricultural implements of the latest and most suitable kinds for this district; also to arrange for the purchase of a few bags of seed wheat from the Roseworthy Experimental Farm, where advice could be procured in purchasing the earliest maturing, hardiest, and most prolific wheat, or any other grain that would be the most suitable to grow in a comparatively dry climates. The Professor should be in a position to give sound advice with regard to the most suitable wheat to grow in each locality. Members should meet annually for the purpose of inspecting the growing crops in the district, with a view of procuring the best kinds of wheat and adopting the most approved methods of cultivation. They could unite for the purchase of wheat sacks, drills, manures, or any other requisites that the members may require in agricultural pursuits. The members should, when practicable, adopt the latest and most reliable methods of cultivation, which should be a benefit to themselves and an example for others to follow. In order to promote good fellowship among the members, at the conclusion of each year a social meeting should be held, to which friends could be invited and short speeches made, reviewing the past year's operations. Then the most sceptical must be convinced that meeting frequently to discuss matters affecting their interests must be of some benefit to themselves and the district.

Narridy, August 4.

Present—Messrs. A. McDonald (chair), J. C. Myatt, Thos. Dunsford, H. Nicholls, John Smart, J. Liddle, R. Satchell, D. Creeden, and Jas. Darling (Hon. Sec.).

BULLS.—This Branch supports the proposition that the improvement of dairy herds should be fostered by the State subsidising pound for pound subscriptions raised by any Branch of the Bureau for purchase of pure-bred dairy bulls.

OFFICERS.—Past officers were thanked, and Messrs. A. McDonald and Thos. Dunsford were elected Chairman and Hon. Secretary respectively.

Meadows, August 6.

Present—Messrs. W. Pearson (chair), J. Catt, T. B. Brooks, G. Ellis, G. Usher, T. Usher, T. W. Vickery, G. Tester, W. Nicolle, W. J. Stone, G. Rice, T. A. Buttery, F. W. Dohnt, and D. D. Murphy (Hon. Sec.).

SEED EXPERIMENTS.—The following seeds from Central Bureau were favorably reported upon:—Oxheart cabbage, Japanese climbing cucumber, kohlrabi, Camphor tree, Cow pea. Many varieties of seeds failed to germinate.

WINTER HOUSING OF MILCH COWS.—Mr. G. Usher addressed members on the subject of "Why it pays to house milking cows during winter." His reasons were that cows keep in better health than when left in open paddocks; they give more milk, and he had proved it to be the case directly they were housed and fed; the quality of the milk improves; cows last longer in milk; time is saved, both in milking and in fetching in the cows for milking; the manure saved from stalls pays for all the trouble and expense. Mr. Pearson thought it pays to house the cows, but the difference in profit was not as great

as he had thought it would be. Cows would be just as healthy if fed and turned into a well-sheltered paddock. The chief objection to stalling cows was that they became so dirty. Mr. Dohnt said cows should not be tied up when being fed. A rail at the back would keep them in the stalls.

BACON FACTORY.—Resolved to endeavor to secure the establishment of a bacon factory in the neighborhood, in connection with the butter factory, if possible.

Paskeville, August 4.

Present—Messrs. A. Goodall (chair), A. C. Wehr, H. F. Koch, J. Bussenschutt, F. Bussenschutt, G. Bammann, G. Meier, J. H. Nankervis, J. C. Price, and W. S. O'Grady (Hon. Sec.).

SEEDS.—All seeds received from Central Bureau for experimental purposes have failed through the drought.

BULLS.—Members prefer the present system of loan of pure-bred bulls by the Department of Agriculture.

STALLIONS.—Mr. Nankervis was of opinion that a tax upon stallions kept for hire would prevent many mongrels being used, and this would be highly beneficial. The use of weedy entires was causing deterioration of horse stock. He contended that for all classes of domestic animals—from poultry to draught horses—the sire should be of pure breed, and have a pedigree to prove it. Very often a well-fed mongrel was better looking than a well-bred though poorly fed and undeveloped animal. The well-bred sire would leave his mark on his progeny; so would the mongrel. The numerous nondescript bulls that were allowed to roam at large ought to be shot, as they prevented any farmer who might be ambitious to improve his dairy herd from doing so by the use of a pure-bred dairy bull. Many farmers do not realise the great advantage to be gained by improving the breed of their stock. In his own experience he had been able to obtain between £6 and £7 for a young heifer that was fairly well bred, whilst there were many animals of similar age that the same buyer would not give 30s. for. Mr. C. Price thought a stallion tax would never work, as it would interfere with the liberty of the subject. If a farmer wished to use inferior sires the loss was his own. The Hon. Secretary did not agree with this, because the individual farmer is often too careless or did not know any better.

Wilmington, August 6.

Present—Messrs. J. Hutchens (chair), J. Hannagan, J. Schuppan, R. Cole, J. Lauterbach, J. Zimmermann, W. Slee, T. H. Harris, A. Maslin, R. G. S. Payne (Hon. Sec.), and two visitors.

SKINLESS BARLEY.—Mr. Zimmermann reported that skinless barley was doing well, and promised to be very prolific.

EXPERIMENTS WITH SEEDS.—Owing to drought and locusts, members generally had no satisfactory results from seeds sent up from Central Bureau. Varying success had attended the trials of varieties of sorghum, maize, and fodder grasses. Sorghum and Kaffir corn had been very successfully grown by the Hon. Secretary last season, but maize failed. Wheats sown this year were now showing very well.

SORE SHOULDERS ON HORSES.—Mr. J. Hutchens read the following paper:—

As most people who work horses are interested in this subject, I have thought that a few remarks thereupon of a practical nature may be of present and future use. Everything that can be done to prevent sore shoulders should be done, and when they do occur early steps

should be taken to cure them. It is my opinion that more sore shoulders are caused by horses having to work in collars too large for them than anything else. If a collar is too large it will press on the outside of the shoulders, and will very soon bruise the horse to such an extent that either one or both will become very sore, and if a collar is too wide in the draught it will have the same bad effect. A collar should fit evenly all round the horse's neck. It does not matter how hard a collar is so long as it fits properly. This has been proved by the fact that horses can work in iron collars. Some people hold to the idea that a collar requires to be stuffed with horsehair, but I have found that horses get fewer sore shoulders if worked in a hard, firm, rye-straw collar than they do if worked in soft horsehair-stuffed collars, and collars lined with leather are much better than those lined with check, as perspiration penetrates the check readily, and tends to keep the horse's shoulders wet and soft. When horses' shoulders do become sore—which is often the case when they are worked hard and exposed to all weathers—I have found that blacklead and lard mixed well together to a nice soft paste is the best ointment to apply. It should be applied before the collar is put on, and if used every time before the horse is worked in most cases will effect a cure.

Hartley, July 27.

Present—Messrs. A. Dalton (chair), H. Reimers, T. Jaensch, A. Thiele, J. Stanton, W. Klenke, W. Kutzer, and B. Wundersitz (Hon. Sec.).

STORING WHEAT.—Members consider the best way to store wheat in a barn is to stack two layers in bags along the floor and leave a 6in. space between the rows.

BULLS.—Members are not sufficiently interested in pure-bred stock to trouble about the same.

HOW TO HANDLE YOUNG HORSES.—Mr. A. Jaensch thought horses should not be above 3 years old before being broken in; when older they will generally be found more troublesome. They should be treated with patience and kindness. Mr. J. Stanton thought a colt should first be taught to work by itself by fixing ropes to the hames-hooks, then one man should lead the colt, whilst another pulls, very gently at first, on the two ropes, gradually increasing the strain. If this is done the animal will never jib with a reasonable load. Grooming will also tend to make a horse quiet.

OFFICERS.—Officers for past year were thanked. Mr. A. Dalton was elected Chairman, and Mr. B. Wundersitz Hon. Secretary.

Swan Reach, August 4.

Present—Messrs. J. L. Baker (chair), F. F. Brecht, L. Fidge, E. Micke, J. Harris, D. Rowe, W. J. Lange, W. White, F. Fischer, O. Halliger (Hon. Sec.), and four visitors.

CATERPILLAR PESTS.—Mr. P. A. Beck forwarded two different kinds of caterpillars, one of which was very destructive on grass land, but the other had appeared in millions this year and was destroying the crops; on one farm alone from sixty to eighty acres had been destroyed. The Chairman found that where he burnt the stubble the land was quite free from these pests; but Mr. Harris had plenty of them on his stubble land that had been burnt. Members wished to know how to destroy the insects [The only practicable remedy would be to run a heavy roller or bushed harrow over the affected patches. These processional caterpillars usually congregate and move in bodies, and by rolling immense numbers can be destroyed.—GEN. SEC.]

BRANCH SHOW.—Mr. Drogemuller wrote in connection with the proposed united Branch Show at Scrubby Flat on the 28th September, that he had been informed that all the large importers and manufacturers of farm implements had agreed not to exhibit at any of the various country shows.

RABBITS.—Considerable discussion took place on this subject. Members were of opinion that the Government or the District Council should do something to destroy the rabbits which exist in millions on the open, unoccupied country round this locality.

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the year monthly meetings had been held, with an average attendance of nine members. A united Branch Show was held in September with satisfactory results. Two papers had been read and discussed, and numerous practical matters had received consideration. Trials with seeds had not been a success, owing to the exceptionally dry seasons experienced. On the whole steady progress had been made, but the attendance was not so large as it should be, and members and residents generally did not avail themselves as fully as they might of the opportunity the Branch affords them of obtaining information on all matters of practical interest.

Baroota Whim, August 6.

Present—Messrs. F. H. Fluggie (chair), T. Simper, C. F. Bessen, A. Raneberg, and C. W. Hoskin (Hon. Sec.).

EXPERIMENTS WITH SEEDS.—Mr. C. F. Bessen reported Dart's Imperial wheat very strong, and will probably give a heavy yield; 4ozs. seed in 1897 increased to 3bush. last season. Bartlett's Crossbred, 2ozs. sown last year gave 14lbs., and this shows well this season. Marshall's Hybrid, 4ozs. sown this year is now very healthy and 1ft. high. Mr. T. Simper reported failure with all seeds except Marshall's Hybrid, which is 18in. high and very strong. Mr. F. H. Fluggie said Ranjit wheat was very quick and strong in growth. Failures with all other seeds were attributed to drought and locusts. Seeds most suitable for this district are wheat, lucern, sorghums, vegetables, and melons.

BULLS.—Members think that any Branch requiring stud animals should raise subscriptions for purpose, and have a subsidy of £1 for each £1 raised.

Caltowie, August 9.

Present—Messrs. A. Kerr (chair), J. Potter, J. Neate, J. Noonan, L. Graham, A. McCallum, G. Petatz, A. Becker, J. G. Lehmann, J. H. Both, S. Wenham, A. McDonald (Hon. Sec.), and one visitor.

FALLOWING.—The Chairman read a paper to the following effect:—This is the most important work on the farm. He had seen land ploughed after harvest and before seeding, well worked, and manured; but the results had not been as good as upon land properly laid up in fallow, even without fertilisers. With fallow and manures much better results will be realised. When ploughing, the farmer should see that the plough is properly set and runs true, else the land will not be properly ploughed, and makes much heavier work for the team. It is best to work all the four horses abreast, as every horse has then to pull his share, but when the soil is wet and sticky it is not advisable for the horses to walk on the ploughed land and tread it into bog and clods. The best yoke is three in front and three behind, with triangular bars; the upright bar 12in. and the draught bar 14in., fixed about 8in. from hames. These are made of $\frac{1}{2}$ in. iron. With these the horses never get sore on top of neck. Fallowing should commence as soon as possible after seeding. The plough should be set 5in. deep in this district, and the sod should be turned up rather roughly, as it can then be harrowed down more effectually later on. The

three-furrow plough is best, and six or seven horses can be used without any walking on the ploughed land. With more furrows the plough is apt to run sidewise, and instead of turning the furrows they will stand straight up or fall back again. Nine inches is quite wide enough for each furrow, and the land should never be ploughed when boggy or too wet. When the fallowing is finished, if the soil is at all moist, it should be harrowed down to a fine tilth and kept free from weeds. It is a waste of time to work the land when dry.

Cradock, August 11.

Present—Messrs. R. Ruddock (chair), P. Gillick, J. Turner, R. Solly, W. Symons, T. Marsh, A. E. Clarke, W. Haggerty, J. Paterson, J. H. Tredell, J. H. Lindo (Hon. Sec.), and two visitors.

FOWL TICKS.—Mr. Haggerty showed a drawing of a fowl's roost—[Like a gridiron, suspended by four wires at corners, passing through inverted bottle-necks, corked and filled with kerosene or tar, to prevent ticks crawling down to the perches.—GEN. SEC.] He said the ticks are nocturnal, and only go in search of food at night, and if fowls are protected against them at night, ticks would then do no harm. Fowls roosting in trees rarely suffered from ticks, but they did not lay well. The perches should rise gradually from near the ground, and should be secured by wires from the ground in two places to prevent swinging. Mr. Tredell also showed a plan for the same purpose. [Some of the members are mistaken with regard to the fowl tick. There is only one species—*Argas reflexus*—known in South Australia. Many of these ticks are permanently attached to the fowls, on the parts that are bare of feathers, as beneath the wings and on the thighs. Very many, however, hide during the day in crevices about the fowlhouse, or under the bark of trees on which fowls roost; but at night they come forth and attack the fowls. The best plan then is to remove the fowls to a distance of 300yds., after sponging their bare parts with kerosene. Build a frame-house, fix galvanized iron inside the frame; fix grid perches inside, slung by four wires and stayed by wires at corners; keep each wire protected with a small piece of flannel or sheepskin saturated with kerosene. If ticks should after all get into this house, remove the perches, place a heap of straw inside, and set fire to it. Watch the wooden frame outside in case of it catching fire. The heat inside will kill every tick and all their eggs.—GEN. SEC.]

Penola, August 11.

Present—Messrs. E. A. Stoney (chair), D. McKay, Dr. Ockley, W. Miller, E. McBain, L. W. Peake, W. P. Davis, R. Fowler (Hon. Sec.), and one visitor.

EXCURSION TRAINS.—Letters were received from various Branches *re* special excursion fares to Adelaide, and it was decided to take no further action in the matter.

FREIGHT ON FERTILISERS.—Mr. Stoney reported that the rail charges on carriage of fertilisers compared favorably with the charges in the other colonies, and there appeared to be no chance of obtaining any reduction.

TIMBERED GRAZING COUNTRY.—Mr. McKay thought the reason why high grass was often found under trees was that the stock would not eat it owing to being rank and sour. His experience was that stock did better in open country than in timbered country.

HAILSTORMS.—Mr. Stoney read short article from the *Australian Vigner* on fighting hailstorms by cannon firing.

Stockport, Aug. 11.

Present—Messrs. J. F. Godfree (chair), D. G. Stribling, J. Smith, C. W. Smith, G. Burdon, G. Thomas, J. Smith, jun., T. Megaw, W. Barker, S. Rodgers, F. Watts, T. Howard, T. Hogan, J. Murray (Hon. Sec.), and one visitor.

DAIRY BULL.—It was resolved that the Branch did not see its way to purchase bull loaned by the Department.

SEED EXPERIMENT.—The Chairman and Mr. C. W. Smith reported that the turnips received from the Central Bureau were turning out splendidly, and if the sparrows would allow, they intended to save a quantity of seed [Surely the name of a turnip which was “turning out splendidly” was worth recording.—**GEN. SEC.**] Other members had no success with their seeds.

SHEEP.—Mr. Godfree read a paper on this subject as follows:—

The high price ruling for sheep of late years should induce every farmer to keep some, in proportion to the quantity of land he owns. Even the small landholder could keep a limited number. They would considerably increase the quality of the land, and be useful in keeping down weeds, which would otherwise grow and become a hindrance to wheat growing. Putting sheep on forward crops has been proved to have beneficial effects, providing the plant has not been eaten too short. If small holders could only keep sufficient sheep for killing purposes it would be advisable to keep the best Merino wethers. In every way they would prove the most profitable, the skins alone being of more value than any other breed. Larger holders, with a thousand acres or more, besides keeping Merino wethers should keep ewes for producing lambs for market. For these the best feed should be reserved. Wethers could follow in paddocks after ewes had been removed. Merino ewes should be mated with Lincoln rams, as the lambs grow faster and larger than any other cross. These may prove troublesome to fences, but if fences are kept in good order this trouble may easily be overcome. Any cross for market should be preferred rather than Merino on both sides. Care should be taken in buying sheep to procure wethers four or five years old. They are easily fattened on account of being full-grown. Young sheep are far more difficult to keep in good condition. Over-stocking should be strictly avoided. With regard to fences, some farmers may consider the cost of erecting a sheep-proof fence too great. I think while a fence is in course of erection the cost of two or three extra wires would be but a trifle, and when completed would give greater satisfaction than it less had been used. Good gum posts 3 ft. apart, with three steel droppers between, and five wires with one barb on top, would make a lasting fence. This would be found cheaper and more easily put up than using all gum posts.

ANNUAL PICNIC.—It was decided to arrange for the usual annual gathering in connection with the Branch.

Lucindale, August 11.

Present—Messrs. G. C. Newman (chair), E. Hall, G. Humphries, A. Carmichael, W. Dow, H. Langberg, E. Tavender, A. Matheson, E. E. Dutton, (Hon. Sec.), and four visitors.

SEEDS.—Mr. Tavender reported that Laibach lettuce had done very well with him, and he had taken prizes with it at the show. He proposed to save seed for distribution.

Nantawarra, August 6.

Present—Messrs. J. Nicholls (chair), S. Sleep, H. J. Spencer, A. F. Herbert, J. W. Dall, E. J. Herbert, R. Nicholls, T. Dixon (Hon. Sec.), and two visitors.

WOOL-CLASSING.—Mr. G. Jeffrey agreed to give a public lecture on this subject.

SEED EXPERIMENTS.—Mr. Sleep had tried a number of wheats received from Central Bureau, none of which proved any better than those usually grown. He had a variety of beet that did very well, but had lost the name of it. Mr. E. J. Herbert had some excellent tomatoes from Bureau seed, but the mice eventually destroyed all the seed he saved; a fact he much regretted, as he had

a very high opinion of the variety. Mr. J. Nicholls had African sheepbush and tree lucern doing well, but he had not put their value to any practical test; the plants had, however, withstood the drought for a number of years. Mr. Dixon had one plant of the true Tagosaste doing well; Dart's Imperial wheat had yielded well with him. Mr. Dall thought it would be a good plan if someone would put in an acre or so of Tagosaste, and when strong enough, put stock in to feed off it in order to give it a good test.

WESTERN AUSTRALIA.—Mr. H. Hocking, of Western Australia, and a former member of this Branch, forwarded a very interesting account of the climatic and agricultural conditions and prospects of the southern portion of that colony.

TAKEALL.—The Hon. Secretary tabled samples of diseased wheat, which some members thought to be the first stage of takeall.

Hawker, August 8.

Present—Messrs S. Irvine (chair), J. Hill, J. O'Loughlin, J. W. Schuppan, C. E. Harry, A. C. Hirsch, T. Laidlaw, C. W. Pumpa, and J. Smith (Hon. Sec.).

DAIRY CATTLE v. BEEF CATTLE.—The Hon. Secretary thought dairying would not pay in this locality, owing to the long and frequent droughts. Still he thought farmers ought to keep a few good cows, which cost no more to keep than bad ones. There were some very good cows in the district, and the Branch should purchase a pure-bred bull, from which a still better class of cows could be raised. There was a good milking class of Durham (or "Shorthorn"), and from this could be raised cattle that would serve either for milk or for beef. Mr. J. Laidlaw favored the Ayrshires as being the best for dairy purposes, and almost as good as Shorthorns for beef. The Ayrshire was a hardy beast, and would suit this locality better than the Shorthorn. Mr. A. C. Hirsch approved of the Ayrshire for dairy purposes, but would prefer to breed beef cattle, as dairying would not pay, and beef was becoming scarce and realising good prices. He thought the Shorthorn would suit best, as it was a good doer and carried a lot of beef. Resolved that this Branch purchase a good Shorthorn bull.

Holder, August 11.

Present—Messrs F. A. Grant (chair), J. Ware, W. Watt, J. Green, E. Crocker, H. Blizard, W. Wood, J. Maddocks, J. E. Trimming, F. G. Rogers, H. J. Rossiter, E. Jaeschke, J. J. Odgers (Hon. Sec.), and one visitor.

EXPERIMENTS WITH SEEDS.—The following seeds, received from Central Bureau, have been grown successfully by various members:—Melrose sweet melon; Turkish giant, large and prolific sweet melon; McIvor sugar melon; Tomato Helios (several kinds from one packet of seeds), a splendid bearer; Stone tomato, fine and firm; Florida velvet bean; Hungarian water melon; Japanese climbing cucumber, grew well first season, but failed second; Kohlrabi, requires plenty water; Hungarian millet; Laxton's Evolution pea; red and white Kaffir corn, grows splendidly, but some failed to get return of seed; Cow pea—white, black, clay-colored, and Whip-poor-Will, all good bearers; Celery—Giant Pascal.

PIG-KEEPING.—Mr. Rowe read a paper on this subject. He considered Berkshires the best for this district. Cleanliness is essential in all surroundings. In discussion, members prefer boiled wheat to raw grain. Lucern is good food for growing pigs until shut up for fattening. Pigs should have plenty of run. The most profitable weight is between 80lbs. and 100lbs.

Appila-Yarrowie, August 10.

Present—Messrs. P. Lawson (chair), J. C. W. Keller, J. Wilsdon, A. Fox, W. Stacey, J. O'Connell, J. H. Klemm, E. Catford, W. C. Francis, R. H. Grant, and C. G. F. Bauer (Hon. Sec.).

EXPERIMENTS WITH SEEDS.—Some tagosaste (*Cytisus palmensis*) has done well. Dart's Imperial wheat has increased from 1oz. three years ago to 6bush. this year, which has been sown by Mr. C. Keller, and looks very promising.

PRUNING FRUIT TREES.—On July 11, Mr. Geo. Quinn, Horticultural Instructor, gave a practical lesson in pruning fruit trees. Commencing with a year-old tree from the nursery, and going on with others in full bearing, he showed how to prune the different varieties, and gave the treatment necessary for cure of curl leaf on peach trees. Mrs. Bauer provided luncheon for those visitors who could stop to partake of it, and votes of thanks were accorded her and Mr. Quinn.

Gawler River, August 10.

Present—Messrs. A. M. Dawkins (chair), R. Badcock, W. Clark, J. Barrett, D. Humphries, F. Roediger, J. Hillier, and two visitors.

SEED EXPERIMENTS.—Several members reported plants of true Tagosaste doing well; cattle and horses eat it fairly well when there is no other green feed about in summer, but seem to prefer it when they can help themselves to it. The Hon. Secretary reported that the following varieties of plants distributed by the Central Bureau had done well with him:—Broadleaf Mustard; Allhead, Oxheart, and Early Nugget cabbages; Monarch and Skirving's Swede turnips; Chantenay carrot, White Goliath kohlrabi, Burpee's Early pea, Citron and Royal George pie-melons, while the wheats received this year look very promising. Other members spoke highly of Royal George piemelon, while Dart's Imperial wheat was a good variety, and had yielded well. Mr. Barrett reported that Marshall's No. 3 wheat was not doing well with him this year.

Murray Bridge, August 8.

Present—Messrs. B. Jaensch (chair), W. Lehmann, J. G. Jaensch, A. G. Kutzer, and R. Edwards (Hon. Sec.).

DAIRY BULLS.—This Branch is not in favor of the Government subsidising amounts raised by Branches for the purchase of pure-bred bulls, but considers that it would be advantageous if the Government were to raise pure stock at the Roseworthy College, and sell bull calves to farmers.

FIELD TRIAL.—A field trial will be held at Mr. Lehmann's farm on August 29th.

OFFICERS.—Mr. B. Jaensch was re-elected Chairman, and Messrs. W. F. Wundersitz and W. Lehmann were elected Vice-Chairman and Hon. Secretary respectively.

Golden Grove, August 9.

Present—Messrs. J. R. Smart (chair), A. Harper, S. A. Milne, H. P. Day, J. Ross, A. Robertson, T. C. McPharlin, J. Woodhead, R. Smith, J. Anderson, W. Mountstephen, F. Buder, and J. R. Coles (Hon. Sec.).

OFFICERS.—Messrs. J. R. Smart and J. R. Coles were elected Chairman and Hon. Secretary respectively for ensuing year, the retiring officers being thanked for their services.

SELECTION OF SEED WHEAT.—Mr. Smith initiated a discussion on this subject. He had adopted the practice for years and had proved that wheat grown upon a farm for a number of years can be improved by selection of the best part of the crop for seed. He had been growing seed on his own farm for several years, and invariably obtained good returns. He favored binding and heading the crop for seed instead of stripping. Mr. Milne had been favorably impressed by results from seed obtained from another part than from seed grown on his own farm. Mr. McPharlin found seed obtained from Angle Vale or the Peninsula yielded well on his farm; he considered a medium crop of well-matured grain provided the best seed. Mr. Day found it beneficial to obtain seed for sowing on black land from crop grown on red soil. Mr. Woodhead thought seed produced under adverse circumstances would, under good conditions, do well. Mr. Ross said on one of the poorest farms in the district, new Majestic seed wheat sown last year produced a splendid crop, while the crop this year from seed raised the previous season was promising well. The opinions of Professor Lowrie, as expressed in the *Journal of Agriculture* in April, 1899, page 741, were generally supported.

Burra, July 27.

Present—Messrs. F. A. S. Field (chair), Thos. Sandland, J. Flower, F. Duldig, and R. M. Harvey (Hon. Sec.).

WOOLCLASSING.—It was arranged to start a class on this subject under the tuition of Mr. George Jeffrey, early in February next. It was also resolved to request intending students in this class, as well as local station managers, to reserve some fleeces from the coming clip for instruction.

BARNABY THISTLE.—Mr. J. Flower read a paper on this subject. The destruction of this plant (*Kentrophyllum lanatum*) had caused him considerable trouble and expense. He found that cutting the plants down only helped them to increase, so he hoed them up, and at a convenient time burned them; but still they increased. He afterwards found that when there was a good crop of this weed, stock did well on it and proved very healthy for them. Dry ewes improved on it, and also sheep fattened by eating it in September and October. Old ewes, after the lambs had been taken from them, have been fattened on the seed of this thistle, and when killed the mutton has had a good flavor, which he considered was due to the ewe eating the seed. This plant does not grow where grass is thick, but on bare patches, such as old road or tracks. He has been convinced, from several instances that have come under his notice, that this thistle has been the cause of many fertile patches, having preceded the grass and made a seed bed for it. But although it enriches the soil and does good in many directions, he thinks that the Barnaby thistle, as well as many other kinds of thistles, will soon be out of existence in this district.

Albert, August 4.

Present—Messrs. G. Holmes (chair), R. C. Rasmussen, R. C. Norton, R. P. Barnett, C. Setterberg, E. E. Hoffman, F. Drogemuller, W. Clark, A. Steinke, and H. L. Smith (Hon. Sec.).

STANDARD WEIGHT OF CHAFF.—It is the general opinion of members of this Branch that there should be a legal standard weight of chaff, and the same to be 42lbs. per bag.

Dowlingville, August 10.

Present—Messrs. J. Phelps (chair), R. Foggo, T. Illman, G. Mason, J. Birkin, S. Tee, H. Crowell, F. Locke, T. Kenny, G. Inkster, J. L. Broadbent (Hon. Sec.), and three visitors.

SOME ADVANTAGES OF FARM LIFE—The following paper was read by Mr. Birkin on this subject:—

I dare say most of you, in perusing your *Journals*, have noticed at various times papers read at Branches detailing the disabilities which the farming community labor under, and painting in the darkest color possible everything connected with a farmer's life. The reason of my coming before you to-night is on account of a paper recently read by a member of the Appila-Yarrowie Branch, not because it is more highly colored than others, but because it is the latest, and I purpose to criticise it, and point out some of the advantages which I think we farmers enjoy.

When our friend the Green's Plains correspondent favors us with one of his humorous effusions, describing the trials and tribulations of the farmers, we read it in the spirit in which it is written, have our laugh over it, and wait for the next. But when a member gets up and seriously reads such utter trash, which so far as we can see, met with no adverse criticism, I think it is needful that the other side of the picture should be shown. I take it that it is our friend's wish to keep our young people on the farms, and that they should be contented; but had he taken an opposite view he could not have chosen better means to make them disgusted with farm life. It may be said that the writer does not mean all he says, but I do not think the *Journal* should be used for the purpose of publishing anything but facts. Here we have a publication, admitted to be the mouthpiece of the farming community, its cover stating it to be printed "by authority," and issued under the direction of the Minister of Agriculture, and we can well imagine that such accounts of the condition of the farmers of South Australia may be the means of preventing possible settlers from outside the colony.

One of the great advantages of a farmer's life is its independence. I can imagine none more so. He is entirely his own master; he is at the beck and call of no man; he may make mistakes and there is no one to argue the point with him, excepting, perhaps, his better half. Again, he has a constant variation of work, which is far preferable to the dull monotony of city work, and we are told that a change of work is as good as a rest. It is admitted that at harvest time the hours are long, but it is necessary at that season. I deny that at any other season are the hours from 5 a.m. to 9 p.m. At seeding it can hardly be called work to spend a few minutes at 9 p.m. to feed up the teams; there has been a long interval of rest since they were fed at dusk. At other times of the year, while not admitting that we are idle, I think you will admit that the hours of labor are not excessive; but we must recognise the fact that the eight hours' system is not applicable to farming, as the very nature of which occupation will always prohibit it. As to holidays, although we do not enjoy a long one at a time, I think, as a rule, if all our off days for shows, socials, cricket matches, tea meetings, &c., in addition to off days for no particular purpose were to be totalled up, they would be found to amount to even more than most city folks obtain. Our lads can take a ramble with dog and gun, and our women folk can take a drive any fine afternoon to visit their friends. Imagine how the poor shop assistants and machinists in factories would envy them; and although our pleasures may not be so exciting as those of cities, still our young people seem to obtain a fair amount of enjoyment from them. We are agreed that it would be well if excursion trains, with break of journey, could be granted, but here our friend is inconsistent. To be consistent he should have asked for free passes and all expenses paid, for in the "pair of boots and straw hat years" he would have no cash to avail himself of excursion fares. And now we come to the "wire fence banquet," and, by the way, I wonder he should acknowledge we have anything to eat at all. We are all liable at times to be caught in a shower and get soaked, but if the work is of any duration, such as fallowing or fencing, he would be a shiftless man or an idiot who could not provide some temporary shelter, if it were only an old reaper, to be shifted as the work progressed.

Another advantage of country life is that living is cheaper—no house rent to pay, and many articles of consumption are produced at small cost. We can have the purest of milk, freshest of eggs, and the pick of the poultry. The ancient roosters and doubtful eggs we pass on to the townsfolk! Our friend makes a pathetic reference to his patched coat; but I claim even those same patches have an advantage. We are aware that our working attire would not pass muster in Rundle Street, but it is economical, and a man can carry a healthy body and as contented a mind inside a patched coat as he could in the latest production of a fashionable tailor, and as we are all patched we are in the height of fashion. But I have noticed that on high days and holidays our people compare favorably with city people in the matter of dress.

Another great advantage in country life, and one I think that is lost sight of to a great extent, is that we can bring our families up in a more healthy atmosphere, both mentally and physically, than in towns. They escape many temptations and grow up in total ignorance of

the darker phases of city life. The chief disadvantage that we labor under is the uncertain seasons. We can never tell what our returns will be. There is no doubt agriculture is a gambling game; but I do not think the authorities are likely to take measures to suppress it. Then I am in doubt whether the uncertainty of the climate should not be included in the advantages, for this reason—the majority of men dearly love a gamble, and here they can enjoy one to their heart's content; if they have nothing better to do they can, at any time between seedtime and harvest, spend a pleasant hour calculating the odds against their obtaining any returns. I do not think I have exhausted all the advantages accruing from a farmer's life, but I hope I have brought forward enough to show that our lot is not altogether an unhappy one. Let us be contented, but at the same time improve our position if we can. Let us hope and encourage our young people to be hopeful. Agriculture of late years has not had much cash in it, but it is to be hoped that with our drills and manures to increase the yield, multi-furrow ploughs and improved machinery to lessen the cost of production, and with slightly enhanced prices, it will look up again, and this being the case, as an occupation in which to pass through life, I contend it is second to none. [Whatever the farmer's life may be, that of the editor's is certainly not altogether a happy one. This is the third occasion within past few weeks that he has been in hot water for printing too much, while on the other hand he is continually being growled at for revising papers. The paper under criticism was written in so exaggerated a strain that scarcely anyone could fail to be convinced that it was *not* a fair account of the farmer's troubles and trials. — GEN. SEC.]

Kapunda, August 4.

Present—Messrs. H. King (chair) H. T. Morris, G. Teagle, Pat. Kerin, Peter Kerin, J. J. O'Sullivan, J. H. Pascoe, W. M. Shannon, J. O'Dea, R. Shannon, W. Flavel, E. Weckert, J. A. Schultz, and G. Harris (Hon Sec.).

DAIRY BULLS.—Members considered it unnecessary to deal with offer of Jersey bull from the department, as there were already a number of good Jersey bulls in the district. Mr. Morris has some good Jersey stock, and finds the cows good milkers and the milk very rich. Mr. King said the Jerseys did not do well with him, while Mr. Flavel thought the farmers outside required larger-framed stock. The Jerseys were very suitable for cowkeepers near the town.

HARVESTING WHEAT CROPS.—Mr. W. M. Shannon read a paper on this subject to the following effect :—

With the general introduction of the seed-drill and the use of fertilisers on our farms the time has arrived for a somewhat different method of harvesting our wheat crops. With the use of fertilisers we are going to reap heavier crops than in the past, and it is advisable for farmers to more generally use the mower and binder and thrashing machine. If we could get the thrashing done fairly cheap and well, this system would soon be generally carried out. Experiments properly conducted in England for the purpose of determining at what stage of maturity it is most profitable to harvest a wheat crop have proved conclusively that the best time to harvest a crop is when the grain is in the stage known as the "dough"; that is, when the grain is rather soft, but not soft enough to yield a milky fluid when pinched between the finger and thumb. A field of wheat was divided into three equal portions, and observation taken that each portion was equal in all respects to the other two. One portion was reaped when in the milky state, the other in the dough, and the third was left till dead ripe. The plots were then thrashed and weighed separately, when it was found that the lightest yield was obtained from the plot reaped when dead ripe. The crop reaped in the milky stage was heavier, and that reaped in the dough stage was heaviest. Then the grain was sent to the mill to be ground, and the miller decided that the wheat reaped in the dough was the best for color and appearance, and contained 10 per cent. more flour than the dead ripe wheat; the wheat reaped in the milky stage came next, with 8 per cent. more flour and a better appearance in the grain than was presented by the dead ripe crop. The last wheat was partly bleached, had less flour, less gluten, and from 8 per cent. to 10 per cent. more bran and waste than the others. An opinion entertained by various farmers is that the red rust fungus continues to feed upon and shrivel the grain of the wheat plant after it is fully formed and is in its best condition for reaping—that is, in the dough stage. It is very important to remember that the English experiment was conducted upon a crop that was not rusted, and yet there was a result of 10 per cent. of flour in favor of the crop reaped in the dough, also a heavier crop and brighter sample, and there is not the slightest doubt the straw had a much higher nutritive value. The farmer is able to crop off before it is dead ripe, hence there is no loss in shaking out, whereas

during stormy seasons there is often a loss of from two to three bushels per acre. He is able to sell hay which would otherwise have been required for feeding stock, because he can use the straw from the stringbinder as fodder, since it is a great deal better than much of the inferior hay. The chaff from the thrashing machine is also more advantageous to use than that from the stripper, the farmer is hereby enabled to feed an extra number of animals in consequence of saving his straw. The stripper will, of course, have to be kept in case of emergency. The relative cost of binding and thrashing the crops against stripping will, of course, be greater, but, taken altogether, the advantages would far more than compensate the cost by the economising of hay, utilisation of straw and chaff, production of manure, extra yield and superior quality of wheat, absence of loss through shaking out, lessening danger from fire, and the cleaning of the field by gathering the weeds before they produce seeds. The latter would apply very greatly to the weed known as the sheep weed, which is becoming a great nuisance on many farms. The only difficulty I see in introducing this system into our farms is the heavy cost of the thrashing machine. If our farmers would go in for this way of harvesting their crops, perhaps men would be induced to go in for a complete thrashing plant, and travel about from farm to farm with it, and do the whole of the work required at so much per bushel, stacking the straw included. I am aware that many farmers in various parts of the colony have tried the idea of harvesting their crops with the binder and then using the header, but I venture to say the header will never be a success. It does not do the work properly, and leaves far too much grain with the straw. I hope to see the system introduced into our farms in the near future, but fear that, as yet, none of our farmers would care individually to launch out in the heavy expense necessary to purchase all the machinery required, especially as the price of produce is so low.

ROLLING CROPS.—Discussion on this subject took place. Members considered the success of the operation depended upon the season and the nature of the soil. Some members favored harrowing, while others preferred to roll. Mr. O'Sullivan recommended harrowing after rolling in rough or black ground.

Mount Remarkable, August 9.

Present—Messrs. A. Mitchell (chair), G. Yates, W. Lange, C. E. Jorgensen, T. P. Yates, H. Humphries, J. B. Murrell, D. Roper, T. J. Spratt, T. S. Bishop, W. Morgan, and T. H. Casley (Hon. Sec.).

DAIRY BULLS.—Offer of department to sell Jersey bull, Laddie Warwick, to Branch at half the value, under conditions set forth on page 5 of August issue of *Journal of Agriculture* considered very fair, and the practice of subsidising efforts of Branches to purchase pure-bred bulls meets with the strong support of the members.

Mannum, August 10.

Present—Messrs. J. G. Preiss (chair), R. Heidrich, R. P. Scott, J. Nickels, J. W. Walker, B. Baseby, E. Schuctze, A. Faehrmann, W. Kowald, Henry Brown, and one visitor.

FOOD OF PLANTS.—Mr. Walker tabled the following extract dealing with the growth of plants:—"An illustration of the new lights which science throws upon old questions is the modern explanation of an experiment made nearly three centuries ago by the Flemish physician, Van Helmont. In a pot of earth weighing 200lbs. he planted a willow branch weighing 5lbs. He kept the plant well watered, and in five years the willow had gained 164lbs. in weight, while the earth in the pot had lost only 2ozs. Van Helmont inferred that the plant's gain was due only to the water which had been supplied. Modern botanical science proves that the gain was, in great measure, due to carbon absorbed from the air."

TAKEALL.—Mr. Preiss tabled some wheat plants affected by takeall, they were grown on land that last year was manured with 120lbs. of super., and this year with 50lbs. super. per acre. The land was not ploughed this year. Professor Lowrie's remarks on cause of takeall, as published in July issue of

Journal of Agriculture, page 1012, came in for some discussion, and the Hon. Secretary was instructed to ask the Professor for information as to how this complaint can be prevented by cultural operations.

DAIRYING—Mr. J. H. Wilhelm forwarded paper to the following effect:—

Our district, through the prevalence of weeds and "takeall," is becoming more and more unfit for continuous cropping, and it is necessary for us to add grazing to wheat-growing. It is important, therefore, to decide which class of stock we shall keep, sheep or cattle. Dairying should only be attempted where the farmer has a sufficient supply of water throughout the year near home, and can provide some green feed during the summer. Where these are not available failure is certain, as the cattle die from the disease known as impaction—the complaint which has caused the loss of so many cattle on the Murray Flats. So long as I kept cows on dry feed, and watered them once a day—driving them a mile to water—in the summer, I lost money; but since I have had some swamp land for summer feeding in the daytime, with dry grass at night, the cows have returned a profit. It is equally important to select good cows. Many cows do not pay for the trouble of keeping, and these should be fattened off and sold as beef. All the cows should be tested regularly, and the poor ones disposed of to make room for better animals. All my cows, reared or bought, are tested, and their records kept in a book. Some give a small quantity of rich milk, while others give quantity, but not quality. I have found that I can make as much butter from 1 gall. of milk of some of my cows as I made from 3 galls. from some others previously kept. I think we should keep the cow producing a fair supply of rich milk, and for this reason prefer the half-bred Jersey, as they do not require so much food as the larger cows, besides which I find they do better during the dry season. In improving the herd it is equally important to select a bull from a good milking strain as it is to select good cows, as from my experience I believe the bull to have more influence than the mother on the quality of the heifer. In all cases I find the quality of a cow or bull can be largely determined by the escutcheon marks. In all cases the heifer is better or worse than her mother according to the bull used, and some particulars of my herd in this matter may be given. In these tests the pan system of setting milk was adopted. From twenty tests of half-bred Jersey cows a gallon of milk has averaged 8½ ozs. butter. Twenty tests of ordinary breeds only gave 5½ ozs. to the gallon. When it is known that in most instances the half-bred Jerseys were daughters of the other cows, it will at once be seen to what extent I have improved my herd by the use of a pure-bred Jersey bull. Now some further instances on the value of the bull will be instructive. I have a Shorthorn cow named Sneek, which gave a great quantity of milk, averaging 60 ozs. of butter to the gallon. We made 12 lbs. butter per week from her milk, in addition to using some milk in the house. A daughter of Sneek, by an unpedigreed bull showing Jersey strains, averaged 80 ozs. of butter per gallon, and yielded about the same quantity of milk as her mother. Cherry II., a daughter of Sneek, by a Shorthorn bull of inferior milk quality, only gave 60 ozs. of butter per gallon, and other heifers by this bull were no better. Jersey III., by a Jersey bull from Sneek, averaged 7½ ozs. butter to the gallon of milk. Now if we buy two cows at £5 each—one being a good-looking Shorthorn, and the other a bony, half-bred Jersey—both giving the same quantity of milk, the latter will be the more profitable owing to the milk being richer. On 2 galls. milk a day for six months the Jersey will eat less feed and produce a better return by £1 14s., with butter at 6d. per lb. average. If in milk for six years this means £10 4s. more than the Shorthorn, while at the end of that time the Shorthorn would not realise from the butcher more than £4, against £2 for the half-bred Jersey.

Millicent, August 2.

Present—Messrs. H. F. Holzgreffe (chair), W. R. Foster, H. Warland, R. Campbell, A. McRostie, H. A. Stewart, W. J. Whennen, and E. J. Harris (Hon. Sec.).

POTATOES FOR STOCK.—The Chairman referred to the use of potato as food for stock. He found stock, including poultry, did much better on them when steamed or boiled as compared with raw potatoes. For horses or cows steamed potatoes were nearly as good as chaff. Better use could be made of the potatoes than was often done; frequently they were left on the ground too long, the result being that they appear to become distasteful to stock. Mr. Foster used potatoes mixed with bran and pollard for his poultry, and they did well on it. Mr. Campbell said that white sago was reported to be made from potatoes, and thousands of tons of the tubers were used in America in the manufacture of starch.

Pigs.—Mr. Campbell said he had been giving his pigs charcoal lately, using as much as two bags weekly for twenty-two pigs, and they appeared to benefit considerably. Mr. Foster said many people made the mistake of thinking the pretty pig the best. The best pig was the one that gave the largest proportion of the choicest parts, and for this reason, the Tamworth pig was meeting with the approval of bacon-curers. Mr. Campbell had obtained a Tamworth boar for crossing with Berkshire sows; his experience of the cross-bred was highly satisfactory, and others in the district were equally pleased with them. The Chairman thought probably there was a good deal in the contention that the Berkshires were too fat, and that the Tamworth cross would rectify this. He called attention to Mr. Mullins' experiment in clearing the farm by means of pigs, and was sorry others had not followed his example.

CO-OPERATION.—Mr. Campbell read the following paper on this subject:—

An American general was once asked how he gained a certain victory. He replied that he "kept pegging away." The writer and others many times attempted to arouse the interests of producers in the above subject, but so far not much result is manifested, so one supposes that, like the American general, we must "keep pegging away," and may be, just as we are dying for want of breath, it may dawn on the bucolic mind that there is something in the business. There are many ways in which a local organisation would be of immense benefit to district producers, and occasionally we hear, as it were an echo, that gives one to understand that in other parts some few at least lament the lack of opportunity for bringing in contact buyer and seller by other means than at present exist, to the mutual advantage of both. Mr. Lehmann, of the Kanmantoo Branch, in *May Journal* crudely touches on the matter and suggests a local storekeeper or blacksmith's premises, where lists of goods for sale might be kept—I presume he means second-hand machinery and such like. Our American cousins have already made this sort of thing a successful business, which they call "A Labor Exchange." The business is conducted by an organisation such as a local Farmer's Co-operative Association could do, and lists of goods wanted and for disposal are exhibited. In some instances these businesses have grown to considerable dimensions and all sorts of products of labor are exchanged. Michael Fleurschiem (who is now in New Zealand) would conduct a business and labor exchange on the same principles as banks now carry on their business, i.e., by a debit and credit account, which might almost be called a scientific system of barter. Unless the business is properly understood in all its fundamentals it might possibly frighten the ordinary mind, but there is no reason at all why a modified system of "Exchange" business could not be carried on in all farming districts in connection with the purchasing of many of the requirements for home and farm use. In America an institution known as "the Grangers" or "Patrons of Husbandry" existed some years ago and was a mighty power against extortioners and railway-robbers, who considered that the farmer was made for them, not they made for the farmers. In ten years 24,290 charters were issued for "granges," embracing 763,263 members. They had a strongly worded constitution and the preamble to which contained the following:—"The soil is the source from which we derive all that constitutes wealth; without it we would have no agriculture, no manufacturers, no commerce. The art of agriculture is the parent and precursor of all arts, and its products the foundation of all wealth." The objects of these institutions were manifold. Mutual instruction, protection against monopolies, diffusion of knowledge to lighten labor, enhancing the comforts and attractions of homes, fostering mutual understanding and co-operation, reduction of expenses in home-living and farm management, diversity of crops, encouragement of a cash system of purchase and discouragement of every other system tending to prodigality and bankruptcy were among the many questions they actively discussed and practically carried out. Regular periodical meetings of a social and instructive character were held. Lecturers came from other granges and discoursed on farm and home topics. Songs and music played no little part in bringing audiences together, and the enthusiasm of members made things go lively and strong. They combined against railway companies' extortionate rates, and had laws passed and State Commissioners appointed to enforce them. At present the Grange is comparatively dormant, there not being much need for the organisations, as Governments, fully knowing the value of agriculture and its kindred occupations, have fostered them by all they know, and at the same time have not destroyed the self-reliance of patrons, and, should occasion arise, the Grange will expand to its former powerful proportions. With such an example before us, should we not make some small attempts to remove some of the disadvantages which agriculturists labor under, that they may have more of the real pleasures of life and less of its hardships and inconveniences. The way out is through Co-operation.

Mr. Foster said co-operative effort, to be successful, must begin in a small way. He thought producers would do well to establish retail produce markets

in all small towns, so that there would be no necessity to employ an agent or middleman whenever they had anything to sell. The Chairman said the idea suggested by Mr. Foster was worked out in most towns in Germany with satisfactory results. Mr. Campbell said all successful co-operative efforts in England had commenced in a small way, and had grown, many to enormous proportions. He deprecated the idea of rushing into a co-operative store business. If they could not co-operate successfully to dispose of their own products they would court failure by going into the more difficult and cumbersome business. In many small things they could combine. He and some others had combined to send a truck of fat pigs to market, with decided advantage. With an organisation such as he suggested, the members would always know when a truck was being sent, and individuals only having one or two animals to dispose of would get them realised as cheaply as if dealing in a large number. Other members agreed with Mr. Campbell, and regretted the lack of interest shown by producers in this matter.

Watervale, August 6.

Present—Messrs. C. A. Sobels (chair), S. Solly, H. Scovell, H. Beck, J. Thomas, G. Hunter, L. Buring, G. Holder, and E. Treloar (Hon. Sec.).

SEED EXPERIMENTS.—Members reported that their experiments during past few years with seeds received from the Central Bureau had from various causes mostly resulted in failure. Several members had been very successful with Broadleaf mustard, some marrows, and kohlrabi.

WHEAT PESTS.—Messrs. Hunter and Thomas reported small grubs destroying the wheat crops in patches. The grubs were very numerous in the soil.

Colton, August 4.

Present—Messrs. P. P. Kenny (chair), W. L. Brown, Jno. Shipard, M. S. W. Kenny, W. McElder, E. Whitehead, W. J. Packer, and R. Hull (Hon. Sec.).

BROADLEAF MUSTARD.—The Hon. Secretary has been very successful with this plant from seeds received from Central Bureau. It grew very well as an early feed. Most other seeds had been failures, the past few seasons being exceptionally dry.

WHEAT PESTS.—Mr. Shipard reported extensive damage to crops and grass by caterpillars, 1,090 acres of wheat and many hundred acres of grass having been eaten, scarcely a vestige of green being left. The trail of the caterpillars is about 4ft. wide and in some cases half a mile long. They appear to move along at the rate of about 12ft. in twenty-four hours. Grass 6in. in height completely disappears under their attacks. Farmers were going to try rolling with a clod roller. [Surely where the track of the caterpillars is so defined they could have been destroyed by means of a heavy roller or bushed harrows, or even a flock of sheep driven back and forwards before they had done so much damage.—GEN. SEC.] Considerable damage is also being done by a small brown beetle which attacks the wheat plant. They fall to the ground as soon as the plants are touched and are very hard to find owing to their color. [Unless rolling will destroy them it is difficult to know what to do to get rid of the insects. Various remedies would succeed were only a few yards of ground affected, but in the open field they are impracticable.—GEN. SEC.].

SIZE OF WHEAT SACKS.—The Chairman initiated discussion on this subject. Members favored the 4bush. bag, as at present. There would be more trouble in

sewing up the smaller bags, and there would also be the danger that with the small bags boys and youths would be expected to load up the wheat by themselves, doing considerable injury. Members also thought it would be quite as much trouble for one man to load up with the 2bush. bags as two men with 4bush. bags.

EARMARKING SHEEP.—The Hon. Secretary read a paper on ear-marking to the following effect:—

He had submitted this matter to the attention of the Branch without effect. In nearly all parts of the colony there is confusion caused by earmarks. Brands do not last more than six months unless tar is used, and that is very injurious to the whole fleece. Twice branding in one year cannot be beneficial on the value of the wool, and then there is the trouble to be considered. Where earmarks are used there is great opportunity for duffing. Suppose A uses a front notch on the ear; B has two; C has one on front and one on back of ear; D has one back and two front, and so on. The owner who has most notches, if he chose to do so, could duff all of A's sheep, and could do it openly if there were no brand on the sheep. He had seen sheep's ears so numerous notched as to look like a cogwheel. To amend this he suggested division of the colony into districts 100 miles by 50 miles, north and south, and the district councils should keep registers of all sheep marks, and so regulate matters that no one should own an earmark resembling that of any neighboring owner. The man at the north end might use a similar mark to another at the south end, and the man in the centre could have a mark like that of the centre owner in any adjacent district. When any person sells any sheep he should send a note to the Registrar of Brands saying he had sold so many to such and such a person. If this were done it would put a stop to sheep-duffing to a great extent.

Mount Gambier, August 11.

Present—Messrs. J. Umpherston (chair), A. J. Wedd, J. C. Ruwoldt, W. Barrows, T. H. Williams, J. Bowd, W. Mitchell, G. Bodey, M. C. Wilson, J. Watson, and E. Lewis (Hon Sec.).

BULLS.—A long discussion took place as to which breed of bull would be most likely to improve the dairy herds of the district, but no conclusion was arrived at.

WORMS IN SHEEP.—Mr. Williams read a paper to the following effect:—Many young sheep die every year in the South-East from enteritis, accompanied with diarrhoea. This has been attributed by some people to coast disease. Investigations conducted in England by Professors Brown and McFaghan discovered great numbers of minute white worms buried in the mucus membrane of the abomasum (fourth stomach) and intestines, and these were the cause of the complaint. Mr. Williams had invariably found worms in sheep in the South-East, and had placed specimens before members at the latest meeting. Although the above professors had mentioned that the various drenches gave little or no satisfaction, Mr. Williams had recommended the following, which had been spoken highly of by several sheepowners:—Dissolve 1lb. sulphate of iron and 3lbs. common salt in 2galls. of warm water. Give half a pint as a drench, but take care that none of the liquid passes down into the lungs, as that would kill the weaners. This drench is effectual also for worms in horses.

TUBERCULOSIS IN UDDER.—Mr. Williams read an extract from the November, 1899, number of "The Veterinarian," by J. MacLauchlan Young, F.R.C.V.S., and J. S. H. Walker, M.D., D.P.H., University of Aberdeen, in which they say that (despite assertions by some authorities that the udder is rarely the seat of tuberculosis) they had found almost 10 per cent. of the cows had tuberculous udders, and that over 16 per cent. of the tuberculous cows had tuberculous udders. Only one of the udder affected cows could be called a "piner," whilst the others were ordinary dairy cows in fair condition. The prevalence of tuberculous udder explains how tuberculosis can be conveyed

from cows to calves. Every animal which reacted under the test proved on *post mortem* to be tuberculous. Mr. Williams's experience had confirmed this; but the disease might exist in the udder for some months without being noticed. Some suspected tuberculous milk recently sent him showed no signs on first examination, but upon adding 1 per cent. of carbonic acid, shaken up with the milk and left three weeks, the tubercle bacillus multiplied, and proved that the germs had been present from the first. When the cow was killed the lesion of tuberculosis in the udder was considerable.

BUNT.—Mr. Wedd read Mr. Farrar's statement that he had found bluestone unreliable as a pickle for seed wheat to prevent rust. Most of the members had found bluestone very effective in most cases, but sometimes it had partially failed. [Owing perhaps to reinfection or other unexplained causes.—**GEN. SEC.**]

BRANDS ACT.—In reply to questions, Mr. Williams said he understood the Bill now before the House was simply to bring in a system of registered earmarks. In reply to objection that the ear itself could be removed, several members stated that this is now illegal.

Tanunda, August 9.

Present—Messrs. J. Gurr (chair), G. Mann, F. W. Graetz, C. W. F. Lehmann, P. Trimmer, T. Brock, A. B. Robin, M. T. Ellis, and C. Heinemann (Hon. Sec.)

APPLES.—Mr. P. Trimmer read a paper to the following effect:—

This is a subject that has not received much attention amongst our Branches. There are about 3,000 acres of apple trees under cultivation in South Australia; perhaps next census may give the exact acreage. It is a great pity that a much larger area of our highly suitable land is not devoted to this fruit. South Australian apples have topped the British market for the past three seasons because of their very superior quality, and our geographical position also enables us to place our fruit there a month sooner than the Tasmanians. The size of export cases for medium fruits is 28in. x 13in. x 9in., outside measurement, and for large fruits 28in. x 10in. x 12½in.; but in Tasmania and Victoria the packers use the "Peacock" cases, 26in. x 15in. x 10in., outside measurement. Some have tried to use a one-sized case for both large and medium-sized fruits, but it is next to impossible to make a good job of the packing. Some people have sent small lots of apples to friends in England stowed in the hold as ordinary cargo, but were this practice adopted on a large scale it would be attended with calamitous results.

The following are some of our best export apples:—Cleopatra (called "New York Pippin" by Tasmanians, and "Pomeroy" by many hills growers in South Australia) heads the list, especially in this colony. Rome Beauty is later, but is also a good shipper. Dunn's Seedling (Munroe's Favorite in Victoria) is an excellent shipper, and generally fetches a fair price. Stone Pippin keeps well, but does not pay to ship in large quantities. It does very well for shipping to other ports. London Pippin is a very good apple that is not extensively grown here. Newtown Pippin, a very good yellow variety, is a great favorite with salesmen in London. This is likely to be extensively grown in South Australia. There are several others, but the above refer more particularly to Barossa district.

Growers in each district should co-operate and ship their apples under uniform distinctive brands, such as "Barossa," "Stanley," "Coonawarra," &c., instead of each individual shipping under his own brand; then buyers would know what they are purchasing. The growers of each district could employ a specialist to pack their fruit; contract with purchasers (as is done in Tasmania) to deliver so many cases of any particular variety f.o.b. at Port Adelaide. A London firm offered to enter into a contract to purchase 10,000 cases of Cleopatras annually for five years, at 7s. per case, f.o.b. at Port Adelaide. Of course, only really good apples should be packed for export, and if co-operation existed the culls could be evaporated or manufactured in some way. Messrs. Evans Bros., of Keyneton, have five paring and coring machines, worked by a small oil engine, and they have put through 295bush. of apples in six and a quarter hours. In 1897 they had 14 tons of dried apples (rings), and in the same year they gathered 9,000bush. of apples from their 100-acre orchard. If private persons can successfully carry on such a business, surely a co-operation could do the same, but petty jealousy and suspicion must first be abandoned. Some people seem averse to give any hints to

their neighbors, lest their products should rival their own. Mr. E. Burney Young suggested that a pamphlet re South Australian products should be published, as this would tend to bring British purchasers and colonial producers together. There is no danger whatever of over-production. Our fruit comes in at a time when the British markets are comparatively bare of fruit, and if we can secure sufficient space in the first steamers we shall be all right. At present the Tasmanians apply early for sometimes double the space really required, and thus they block others from obtaining it. [The shipping companies always notify the other colonies, and it is our own fault when space is not secured in time.—GEN. SEC.] In 1899 America sent to England 6,000,000 bush. of apples. Owing to the short voyage they are not obliged to pack so carefully as we must, and they are not so particular as to quality. A man can make a very comfortable living upon 10 acres of exportable apples. The work is very clean, and not much of it. But it will not pay to grow apples to store for winter sale in the city markets, for 300 bush will glut it. The Coonawarra apples ripen at least a month later than in Barossa district, and they would swamp us out. The idea must be to grow the best stuff for export, send it to the consumers in the best and most attractive way. The market is there for hundreds of thousands of bushels.

EXHIBITS.—Mr. P. Trimmer tabled lettuces, very bitter [What kind?—GEN. SEC.], cabbages, supposed to be Drumhead, looked more like hybrid Sugarloaf. He said seedsmen should be more careful. Neither of the above were of any value.

PEACH APHIS.—Mr. P. Trimmer said he had successfully used a piece of oilcloth tacked tightly around the stems of his peach trees, the smooth surface inside, and the outside painted with tar, renewed when getting dry. At end of season the oilcloth was removed. [The aphides would still remain on the roots and do some damage.—GEN. SEC.]

EXPERIMENTS WITH SEEDS.—The following seeds received from Central Bureau were reported upon:—Kentucky Wonder pole bean, a splendid bearer, hardy, large, very fleshy, good flavor, re-distributed to gardeners, who all pronounce them the best grown; Early Valentine and Golden Cluster are also very good in flavor, but not so fleshy and prolific; Tom Thumb tomatoes, very large and good bearer, in clusters, good flavor, but not suitable for transit, as the skin is too thin.

Port Pirie. August 4.

Present—Messrs. P. J. Spain (chair), E. J. Hector, J. Lawrie, T. A. Wilson, T. Gambrell, T. Jose, G. M. Wright, G. Hannan, H. B. Welch, R. F. Humphris, W. Smith, and R. J. Ferry (Hon. Sec.).

BULLS.—Members approve of suggestion that Branches should purchase pure-bred dairy bulls by subscription, with a subsidy of £1 from the State for each £1 raised.

AGRONOMICAL MUSEUM.—Decided to commence formation of a museum for agricultural and horticultural products, destructive insects, birds, and chemical and mineral manures.

Redhill, August 9.

Present—Messrs. S. H. Treloar, (chair) R. T. Nicholls, A. A. Robertson, A. E. Ladyman, D. Lithgow, J. Pilkington, D. Steele, H. Darwin, F. Wheaton, and J. N. Lithgow (Hon. Sec.).

ANNUAL REPORT—The Hon. Secretary's annual report showed that during the year seven meetings were held, with an average attendance of nine members. Five papers had been read and numerous practical matters discussed. Messrs. R. T. Nicholls and J. Pilkington were elected Chairman and Vice-chairman respectively, and Mr. Lithgow re-elected Hon. Secretary for ensuing year, the retiring officers being thanked for their services.

DAIRY BULLS.—This Branch supports the proposal to subsidise amounts raised by Branches for purchase of pure-bred dairy bulls.

RIB GRASS.—The Chairman drew attention to Dr. Yeatman's statement at Auburn Branch that on a section of land planted three years ago with rib grass the plant had died almost right out this winter. Members would like to know if the General Secretary could give any reason why this occurred. [No, I cannot. I know nothing of the character of the soil nor the treatment it has received. Dr. Yeatman possibly might give his opinion of the cause of failure. GEN. SEC.]

Forster, August 7.

Present—Messrs J. Johns (chair), F. Johns, John Johns, W. Johns, J. Sears, J. Childs, A. Schenscher, C. Bolt, F. Towill, W. Sears, J. Retallack, E. Schenscher (Hon. Sec.), and four visitors.

EXPERIMENTS WITH SEEDS.—Mr. A. Johns has one plant of *Cytisus palmensis* (true tagosaste) 2ft. 9in. high. Dart's Imperial wheat is the only other variety of seed received from Central Bureau that has given full satisfaction. It resists drought better than any other, weighs heavy, is very strong in the straw, and is generally sown throughout the district.

Lipson, August 11.

Present—Messrs. G. Provis (chair), C. Provis, H. Brougham, W. F. Darling, J. Brown, J. McCullum, R. Haldane (Hon. Sec.), and three visitors.

EXPERIMENTS WITH SEEDS.—The Chairman was much pleased with Short Stump carrots from seeds sent by Central Bureau; nearly all other seeds failed through drought.

EXHIBITS.—Mr. C. Provis tabled several bundles of wheat plants, showing the highly beneficial results of manuring with superphosphates.

POTATO-GROWING.—Mr. Provis places his setts in furrows 2ft. 6in. apart, 1ft. between the setts, and 4in. deep, with manure on the setts.

Arden Vale, August 13.

Present—Messrs. E. H. Warren (chair), M. Echert, C. Pearce, A. M. Fricker, G. Williss, G. Miller, A. Hannemann (Hon. Sec.), and five visitors.

EXPERIMENTS WITH SEEDS.—Mr. Fricker spoke favorably of Royal George piemelon. Mr. Pearce has succeeded with *Cytisus palmensis* (true tagosaste), others have failed owing to drought.

Robertstown, August 13.

Present—Messrs. N. Westphalen (chair), A. Day, A. Rohde, H. Kotz, W. Farley, T. Hagley, and S. Carter (Hon. Sec.).

SEED EXPERIMENTS.—Members reported failure of their experiments with seeds owing to the drought.

STANDARD BUSHEL.—Discussion took place on the standard bushel and grading of wheat. The majority favored a high standard, as securing a better name, and consequently a higher price for our wheat in the home market. The local market being influenced by home prices, a higher price would be obtained locally also.

Scales Bay, August 11.

Present—Messrs. E. R. Aitchison (chair), W. J. Thomas, Chas. Nugent, and D. Thomas (Hon. Sec.).

EXPERIMENTS WITH SEEDS.—Drought was the cause of failure of most of the seeds sent out by Central Bureau, but Gravestock's Frampton wheat is considered to be very good by Mr. Plush, at Mortana, and Mr. Newbold strongly recommends Johnson grass (*Sorghum halepense*).

GRUBS AND CATERPILLARS.—Near Streaky Bay a small grub is cutting off the forward crops by gnawing through the knot in the straw; one farmer considers that one third of his crop has been destroyed. Caterpillars are doing a deal of damage to the crops at the west end of this district. Mr. W. J. Thomas has lost forty acres, and a neighbor has lost more. The Hon. Secretary advised rolling the crops; Mr. Nugent recommended a plough trench with holes dug in it at 30ft. apart and 1ft. to 2ft. deep.

Mount Pleasant, August 10.

Present—Messrs. G. Phillis (chair), W. Vigar, J. Maxwell, P. Miller, F. Thomson, and J. A. Naismith (acting Hon. Sec.).

EXPERIMENTS WITH SEEDS.—Mr. Vigar reported Leland's wheat doing well and Early Noe fairly well, but millers object to it. Most of the varieties sent up were of bearded varieties, which are not approved in this district.

DAIRY BULLS.—Resolved that this Branch is of the opinion that instead of looking to the Government for assistance in purchase of bulls it would be better for each Branch desiring good animals to purchase them at their own cost.

Boothby, August 14.

Present—Messrs. J. T. Whyte (chair), D. Sims, T. Sims, A. Robb, R. M. B. Whyte, R. Chaplin, G. T. Way, T. B. Robinson, H. S. Robinson, and R. Carn (Hon. Sec.).

DAIRY BULLS.—It was resolved that this Branch favors the subsidising by the Department of Agriculture of amounts raised for the purchase of pure-bred bulls, also that the principle should be extended to other stock. The Chairman thought a first-class draught stallion would be a great boon to the district.

POULTRY.—Mr. A. Robb said he had thirteen fowls and one Indian Runner duck, and got more eggs from the one duck than from the thirteen fowls.

GRADING AND HANDLING WHEAT.—Discussion took place on these matters, members favoring the retention of present systems.

Richman's Creek, August 13.

Present—Messrs. W. Freebairn (chair), A. Knauerhase, P. J. O'Donohue, J. J. Searle, J. J. Knox, A. Nicholson, J. J. Gebert, M. Hender, E. Roberts, J. M. Kelly, J. McColl (Hon. Sec.), and two visitors.

SEED EXPERIMENTS.—Members reported that Royal George and Citron piemelons from Central Bureau did well for a few years, but the last few seasons' drought and the grasshoppers had destroyed them. Bartlett's Cross-bred wheat looks a promising variety.

DRILLING AND MANURING—Mr. Freebairn read a paper on this subject to the following effect :—

In many of the older farming districts of this colony it has become almost necessary to use commercial fertilisers with cereals if any crop at all is to be obtained, but it still remains to be proved whether manuring will to any large extent prove profitable. He thought it would pay to apply it to well prepared land, but not on stubble land, as, unless the season proved wet, he would be afraid that the forcing the crops got at the beginning of the season would cause it to blight before properly matured, and though it might yield better than the unmanured crop, the extra return would not pay for the extra cost. On well prepared fallow land, however, he believed a light dressing of manure would prove an advantage, as it would make the wheat start away better, making a stronger and healthier plant, which would keep growing during the cold frosty weather of June and July, besides coming to maturity a week or two earlier than if unmanured. The seed and fertiliser should not be put in together if the ground is dry, as if the seed remains a long while in the ground before germinating there was great risk of the fertiliser injuring it. If they had to sow dry, as was too often the case, he would prefer to drill in the manure and broadcast the seed. It would, however, be better to wait for rain, so that the seed germinates at once. Wheat drilled in with manure comes through the ground quicker and with less moisture than that sown without manure. They would have to be careful not to apply manure when the soil is getting too dry; there was greater risk of the seed spoiling when drilled in soil not sufficiently moist to bring it properly through the ground than seed broadcasted under similar conditions. It was frequently said when these phosphatic fertilisers were first advocated in this colony that they would ruin the land, but he failed to see how this could be if they are applied with judgment. He believed superphosphate would be best in this district, though it might be advantageous to change occasionally and follow super. with bonedust or guano, or perhaps a mixture.

The Hon. Secretary was convinced they would have to exercise more judgment in sowing with the drill than in broadcasting. They must take care not to sow the quick maturing wheats early in the season, or they would be forced too much by the fertiliser and come to head so early that they would be liable to injury from frost. Some of the wheat he drilled in on April 18 was coming into ear now and might suffer injury from the prevailing frosts. Mr. Gebert thought early wheats should not be sown before May, or they would hardly escape injury from frost. Mr. Knauerhase also preferred to sow the later wheats first. Mr. Kelly said his crop manured with super. showed to advantage when compared with that without.

Forest Range, August 9.

Present—Messrs. J. Vickers (chair), R. Townsend, W. Cherryman, H. Waters, O. Kumnick, J. G. Rogers, A. Green, J. Caldwell (Hon. Sec.), and four visitors.

SEED EXPERIMENTS.—Members reported success with several varieties of plants received from Central Bureau, but none were better for market purposes than those usually grown.

EXPORT OF APPLES.—Considerable discussion ensued on an offer made by an exporting company to establish a dépôt, and take half the crop of apples at 3s. per bushel. Mr. Townsend said it seemed to him to be a question mainly as to whether it would pay better to accept 3s. per bushel for fruit of a specified size straight from the garden or to store them, as 3s. from the garden was equal to 4s. per bushel if stored, and there would be less trouble to the grower and no risk of loss in exporting, besides avoiding the losses that always occur with stored fruit. Mr. Vickers thought 3s. per bushel a fair offer under the circumstances, as the loss in stored fruit was sometimes considerable. Scarlet Nonpareil stored in cases had lost about one-third of their bulk from shrinkage. If half their crops were exported, it would relieve the local market, and improve prices. Anyone who grew apples to a large extent knew how difficult it was to get them away, and it would be a great convenience if they could take them direct from the garden to the dépôt. Mr. Green said the average net prices

received for our apples sent to London had been considerably over 3s. per case, and he was afraid they would find that a considerable quantity of their fruit would be rejected by the company under the proposed scheme, and they would then find some difficulty in disposing of these rejects, as, after so much handling, it would not be safe to take them back for storing. Mr. Waters thought the proposal would create a monopoly which would be resented by the rest of the trade.

APPLE HOUSES.—Mr. Vickers thought a good apple house could be constructed without shelves or benches. If the floor were cemented, the apples could be stored in two-bushel cases packed one on the other. This would save a lot of handling, as the fruit could be picked direct from the trees into the cases, and thence taken to the apple house.

Clare, August 10.

Present—Messrs. W. Kimber (chair), J. Christison, W. S. Birks, R. E. H. Hope, G. Lloyd, Geo. Scott, J. T. Hague, S. Smith, and H. J. Yelland (Hon. Sec.).

ZANTE CURRANT.—Discussion on pruning of Zante currant vines took place. Members generally favored pruning to four to six buds rather than leaving long rods. The work can be done much quicker, and the results seem equally as good. Trellis of about 2ft 6in. high was considered the best for this district.

FRUIT PESTS.—Members stated that the application of tanglefoot to the stems will prevent aphids climbing from the roots to the branches of fruit trees. Mr. Birks found tobacco wash destroyed the aphids on the branches, but not on the roots. He intended to try the effect of soot around the base of the tree, also trying tanglefoot on the stems. Reference was made to the early blossoming of fruit trees this season.

Port Elliot, August 18.

Present—Messrs. O. B. Hutchinson, (chair), J. Brown, H. Pannell, R. E. Ullrich, J. Nosworthy, J. R. Coote, F. T. Fischer, J. McLeod, H. Gray, and E. Hill (Hon. Sec.).

DAIRY BULLS.—This Branch is not in favor of the Government subsidising amounts raised by Blanchers for purchase of pure-bred bulls.

SOILS AND MANURES.—Mr. Ullrich read a paper on this subject, as follows:—

The time at my disposal has been insufficient to treat the subject before us in such a manner as it requires. We all know that soils are more or less readily exhausted by cropping, and that we cannot go on year after year taking successive crops off the land unless we recoup the soil for that which it gave to our crops. This fact would become more prominent were it not that only 6 to 8 per cent. of the bulk of the material of the crops come from the soil, the balance coming from the air and the rain. The 6 per cent. or 8 per cent. of plant food in the soil is absorbed by very fine and delicate hairs on the roots of the plant in an exceedingly dilute condition. The chief components of this plant food from the soil are nitrogen, phosphoric acid, potash, lime, magnesia, iron, sulphuric acid, soda, chlorine, manganese, silica, and some traces of some rarer mineral matter. Agricultural chemists speak of the first seven as indispensable to plant life. If one of them be altogether absent the soil is barren, and if one of them be specially deficient it is not fertile, however abundant the other substances may be. Happily it is only some of these substances which may cause the farmer anxiety, namely nitrogen, phosphoric acid, and potash, and now and then on some formations, lime. These three or four substances are in the average soils only present in very small proportions. In 10,000lbs soil, or about 4½ tons, there will be found only 15lbs. of nitrogen, 10lbs. of phosphoric acid, and 15lbs. of potash. A wheat crop of 15 bushels per acre will remove in grain and straw 26½lbs. phosphoric acid, 17½lbs. potash, 11½lbs. nitrogen, and 6lbs. of lime. Now, one might think that the exhaustion of soil would take a great period of years. As, however, only a very small percentage of the soil is available for plant food at one time, temporary exhaustion is possible, though ultimate

exhaustion is impossible. Any good farmer will endeavor to avoid even a temporary exhaustion of the soil by means of manures, natural or artificial. In earlier years, when artificial manures were quite unknown, the manuring of the land was a most serious question. Farmyard manure, all waste from the farm—such as weeds, fallen leaves, road scrapings, &c.—were carefully collected and used. This laudable means of recouping the land is still much in vogue on the continent of Europe. A great number of our farmers are not careful enough with these natural manures. It matters not what name you give it, anything that came originally from the soil, must, when restored to it, enrich it. All farmyard and natural manures should be put into pits, into which the rain waters will flow so as to cause fermentation, and thus kill the germs of the weeds. I stated that nitrogen, phosphoric acid, potash, and perhaps lime are the most likely to become deficient in the soil, and we must, therefore, look for a manure which will supply these substances in sufficient quantities. Phosphoric acid may be replaced by dressing with bonedust, bone charcoal, mineral superphosphate, bone superphosphate, or phosphatic guanos. The value of bones has been long known. More than 100 years ago they were used in $\frac{1}{2}$ in. and $\frac{3}{4}$ in. lengths on permanent pastures, but in time it was found that by crushing them they became more readily available in the soil, and hence we have them now in the form of bonedust or bonemeal. It is now the practice to abstract by steam all or most of the organic matter for the glue and fat. The percentage of nitrogen is thereby reduced, but as the fatty matter retards the incorporation of the bone with the soil the loss of nitrogen is counterbalanced. An average sample of raw bonedust should contain 45 per cent. to 50 per cent. of phosphate of lime and $3\frac{1}{2}$ per cent. to 4 per cent. of nitrogen. Steamed bonedust should give 55 per cent. to 65 per cent. of phosphate of lime and 1 per cent. of nitrogen. Bonedust or bonemeal is spoken of as a lasting manure, and it will often give a higher increased return on the second crops after a dressing with it than on that immediately after its application. As it has only a little nitrogen with it, bonedust has become more popular with farmers who do not understand manuring. But in our days of rapid returns more soluble forms of superphosphate have an advantage. In the manufacture of superphosphate an active acid—sulphuric acid—is mixed with the bonedust in the proportion of 9cwt. of acid to the ton of bonedust. Only a small proportion of the superphosphate in the market is bone superphosphate, or purely vitriolised bones. The great bulk sold being made from mineral phosphates found in natural deposits in various parts of the world. Phosphates are spoken of as “high” or “low” class according to the percentage of phosphate of lime rendered soluble. Well made superphosphates should not be sticky so as to clog the drill, but friable, dry, very fine powder. Basic slag is another useful phosphatic manure. It is obtained as a by-product in the manufacture of steel from iron ore with some phosphorus in it. It is commonly known as “Thomas phosphate.” Less than ten years have passed since it began to be recognised that the slag from the foundry had any value whatever, but at present already hundreds of thousands of tons have been applied to the land beneficially in various countries. In our climate it will never do well to manure wheat directly with farmyard manure; it is much better used for forage crops, as it tends to make a crop foul, and in a dry spring makes the crop liable to be blighted. In dryer areas it should be spread on the land before fallowing and ploughed in. Artificial manures can be used directly for cereals. Phosphatic manures are the most beneficial, in the first instance at least, and bone or mineral superphosphates are preferable. After these come basic slag (Thomas phosphate), phosphatic guano, and bonedust last. In all districts where the rainfall exceeds 15in. or 16in. the cost of carriage of manure is not prohibitive. Nothing will be more profitable than the regular judicious use of artificial manures. At first from $1\frac{1}{2}$ cwt. to $2\frac{1}{2}$ cwt. of superphosphate or other phosphatic manures will be found to force a hay crop to great advantage. It is also very advisable to mix very carefully from 40lbs. to 90lbs. of nitrate of soda or sulphate of ammonia (still better dress separately) with the phosphates, according to our conditions and cropping, as our bare fallowing does not absorb sufficient nitrogen from the air. Thomas phosphate, or basic slag, will answer well in the next crop after application, where the rainfall does not exceed 14in.

Stansbury, August 4.

Present—Messrs. A. Anderson (chair), P. Anderson, C. Faulkner, J. Sherriff, J. Henderson, G. Jones, and P. Cornish (Hon. Sec.).

GRUBS, &c.—Farmers complain of damage done to crops by takeall or grubs. Mr. G. Jones has noticed a small aphid on wheat crops, which cause the plants to assume a yellow appearance. The Chairman said there was less yellow where guano-super had been drilled in with the seed. The Hon. Secretary thought a little sulphate of iron would remedy the evil.

TAKEALL.—Members severely criticised Professor Lowrie's statement that if he were to find takeall in his crops he would attribute it to faulty cultivation, otherwise bad farming. They admit that there may be bad farmers, but there are many who have been depending on their crops for years, and would do their best to avoid loss. Members wanted to know what is "takeall." In this locality they believe it to be due to grubs, and several have noticed that the bare patches in the field are resorted to by crows and magpies, which are evidently there for the food that is to be found. [The "takeall" referred to by the Professor was that caused by ploughing up the land when too dry, leaving the seed-bed hollow beneath. Your Branch considers "grubs" to be the cause of "takeall," others attribute it to salt in the soil, others to parasitic fungi, and so on. Late fallowing is undoubtedly a frequent cause of the failure of crops in patches.—GEN. SEC.]

SEED EXPERIMENTS.—These were mostly a failure through drought and other causes. A few varieties of vegetables were very good, but failed to produce seed. Wheat received this year looked promising. Sugar gums failed.

SULPHATE OF IRON FOR SHEEP.—Mr. J. Sherriff last year lost several sheep from disease unknown to him. As others showed similar symptoms, he mixed a small coffee tin full of sulphate of iron in a large trough full of water. The sheep were all right next day, and he has not lost one since from the same cause. Another farmer had tried the remedy with similar results.

AXLE GREASE.—Mr. P. Anderson found common tallow too hard for axle grease. Some other members mix tallow, Stockholm tar, and oil with satisfactory results.

LIME.—[In answer to question by Mr. P. Anderson, lime is often used to render heavy clay lands friable, and to liberate thereby the various plant foods therein confined.—GEN. SEC.]

TAX ON STALLIONS.—Members consider a tax on stallions unnecessary; they think it would only be another tax on farmers, as the owner would raise his fees to compensate for the tax. It would reduce the number of stallions in the district, and stallions travelling over large districts would be less likely to throw foals, thus making greater risk, which farmers will be slow to incur. Consequently there will be fewer horses on the market in the future, which will be a great loss to the colony, as our horses have proved to be the best in the world, and foreign buyers are coming here to purchase. Such a tax would be sure to drive out of some districts the most suitable kind for the district. Farmers require the heavy draughts for their wagons and want the lighter horses for certain kinds of work on their farms. They will do their best to rear the best stock for all purposes without another tax.

BULLS.—This Branch does not approve of Government spending money on matters of this kind. [The word "not" was omitted in report printed in August number.—GEN. SEC.]

Onetree Hill, August 18.

Present—Messrs. J. Bowman (chair), H. H. Blackham, G. Bowman, J. Flower, A. H. Riggs, J. Hogarth, W. Kelly, A. Thomas, and J. Clucas (Hon. Sec.).

EVOLUTION OF HARVEST MACHINERY.—Mr. A. H. Riggs read a paper tracing the improvements made successively in agricultural machinery during the past century, with a general reference to the advances made by science in all directions. Railways, ocean steamships, telegraphs, telephones, motor-cars, and a host of labor and time-saving inventions were referred to, but more especial attention was paid to the improvements made in harvesting machinery, though extended reference was made to many other labor-saving appliances, as well as to the use of fertilisers, &c.

Amyton, August 9.

Present—Messrs. John Kelly (chair), R. Brown, H. Turner, Thos. Gum, S. Thomas (Hon. Sec.), and one visitor.

BULLS.—Members favor purchase of pure-bred dairy bulls by Branches, for use of dairymen in each district, with a subsidy of £1 by the State for each £1 raised by subscription for the purpose.

ENSILAGE.—Mr. John Gray sent the following paper:—

Ensilage is the preservation of green fodder. By this means stock can be supplied during the summer and early winter months with succulent fodder nearly equal in quality to that which they usually obtain in the spring time. Anything that stock will eat in its natural state may be made into ensilage. It must always be remembered that fodder is only preserved, not improved, by being converted into ensilage, consequently the better the quality of the stuff used the better will be the feed taken from the pit or stack. The economising of fodder is the chief value of the practice of making ensilage. A cow will consume say 40lbs. of hay per day. The quantity of fodder required to make 40lbs. of hay will make fully 120lbs. of ensilage, sufficient to keep a cow for two days. Then not only is fodder economised, but a better result is obtained. Seeing that by the making of the fodder into ensilage the natural nutritive quality of the green feed is retained, it follows that 60lbs. of silage will yield more butter than 40lbs. of hay. The question may be asked, will it pay to convert, say, a crop of wheat into ensilage? Let us put it at its lowest estimate. When a cow consumes 60lbs. of ensilage per day, she eats sufficient fodder to make 20lbs. of hay. Her weekly consumption will be equal to 140lbs. of hay. Eight pounds of butter per week would not be too much to expect from a cow fed in such a way. The amount of fodder required to make a ton of hay if made into silage will keep a cow for sixteen weeks. During that period she would make 128lbs. of butter, which at 7d. per pound will be worth £3 14s. 8d. A crop of wheat that will yield a ton of hay per acre will produce 10bush. of wheat per acre, which at 2s. 6d. per bushel will be worth 26s. Leaving a balance in favor of silage of £2 9s. 8d. Then there are two or three indirect gains that must not be overlooked. In the first place the cows will be kept in good heart and condition, and the flow of milk kept up during the summer months when they usually get very poor, and the supply of milk shrinks to almost vanishing point, requiring weeks of the first green feed to increase the flow to a respectable quantity. Thus a great waste will be saved by using ensilage. Then it is during the time just mentioned that the best price is usually obtained for dairy produce. It is exasperating to the dairyman to find that his cows have dried off just when a payable price is obtainable. And last, but not least, the value of the ingredients of the soil sent away in butter is as nothing compared to what is sent away in wheat. The manure collected is also worthy of consideration. Having shown that the making of silage is a paying business, the next consideration is the method to be adopted. Silage can be made in the stack as well as in the pit. There is, however, more waste in the stack than in the pit, and it is more difficult to apply the necessary pressure. As the pit method of storing fodder is undoubtedly the best, I will confine my remarks to that method. The size of the pit should be in proportion to the number of cattle to be fed. A pit 12ft. x 10ft. and 12ft. deep, with a frame on top 5ft. high—or where there is no frame the pressure will need to be removed after the first filling and filled again—will hold about 13 tons of fodder, or about 26lbs. to the cubic foot. If the fodder is chaffed about double the quantity will go into the same space. The pit may be constructed in various ways, from a simple hole in the ground without building, to a concrete or stone wall, and cemented. As the main feature in preserving is to deride the expulsion and exclusion of air, the smoother the walls the less waste there will be. In my experience I found simply digging a hole did very well the first year, when the wall is smooth. The action of the air and weather, when the pit is empty, causes the earth to loosen, and a great deal of it falls down, leaving holes, out of which the air cannot be expelled when the pit is filled; consequently a great deal of the stuff goes to waste. A good cheap pit can be constructed by building a mud wall 15in. or 18in. thick, carrying it 4ft. or 5ft. above ground. Of course, a concrete wall 9in. thick, or a stone wall plastered will be better. I would suggest, if there is not time to build the wall, and there is a fairly smooth clay wall, let the clay wall do for the first year, and complete the construction for the second season by building a mud, concrete, or stone wall. The corners of the pit should be round, not square. I find there is more waste in the corners than in sides. In constructing the pit the following principles should be observed:—Smooth walls. The larger the surface and the deeper the pit the less waste there will be. There is always about 6in. on the surface, in the bottom, and around the sides that is waste. Of course, if the pit has a large surface, and there are not many stock to feed, the stuff will ferment before it is used. Where there are, say, six cows to feed, the surface of the pit may be 10ft. x 12ft. The filling of the pit must be done with care. Any crop that can be cut with an ordinary mower, and gathered by a horsrake, can be successfully made into silage.

I have only put down two lots—in 1896, and again last year. In both instances the crop I cut would have only yielded about 5cwt. of hay per acre. If the crop is light three hands will be required—one to work the mower, another to rake and lump, and a third to load it on to the wagon. Begin operations when the crop is well in ear, about a week before it is fit to cut for hay. In a light crop care must be taken to cart it as soon as it is cut, otherwise it will be too dry. Put it in the pit carefully, spread it evenly, and tramp it well, especially around the sides. About 5ft. of stuff may be put in per day. If the fodder is fine it may be put in whole; if it is rank and coarse, it should be chaffed. If the weather is very hot and dry, a good quantity of water can be put on the stuff as it is being put in the pit. I have put about 200galls. on 6 tons of silage. If material, such as boards or galvanized iron, is at hand, if the pit is not built, a frame should be erected over the pit 4ft. or 5ft. high. This will save removing the weights and filling up again. If 15ft. of stuff is put in it will settle down to about 10ft. Care must be taken to make the frame sufficiently strong to resist the pressure that will take place when the weight is put on. When the silo has been filled, and the heat has risen to about 130°, the weight should be applied. (I have tested the temperature by driving a crowbar as deeply as possible in the stuff and letting down a round glass thermometer in the hole). [Gaspire is better.—GKN. SEC.] For cheapness and easy handling I do not think that the following method can be improved on:—Put on a layer of rubbishy straw or chaff that will lie close together about a foot thick, and then throw on the dirt that has come out of the pit. Care must be taken to put the earth on evenly. It could be all thrown in the centre of the pit, and it would still look as if it was spread evenly all over. The greater the weight put on the greater will be the subsidence. As it is difficult to tell how much earth has been put on, make five measures, each made by taking a block of wood 9in. square, bore a hole in the centre and put in a stick 3ft. long, place one in the centre and one near each side. These measures will subside with the stuff and indicate exactly how much earth has been put on. It will take about 3ft. of earth to give 2cwt. to the superficial foot, which is the weight that should be applied. When the stuff is to be used take off all the weight and use evenly from the surface. Cows that are not used to it will not eat it readily at first. When they take to it do not give them all they can eat, or they will tire of it and not look at it for several days. Get them used to it gradually. There are two kinds of silage, known as sweet and sour. Sour ensilage is made by filling the pit as quickly as possible and applying the pressure before the temperature has had time to rise above 135° F. Sweet ensilage is made in the way I have described. As sour ensilage is said to be the best for cows, and sweet ensilage is also known to make excellent feed, it seems immaterial how the pit is filled. The principle to be mainly observed is to fill in the stuff leaving as few crevices as possible for the air to lurk in. In conclusion, the making of ensilage is the only hope of successful dairying in the North. There is a great deal of wild oats and other stuff that is made into hay, which is of very little use as horse feed, but which, if made into ensilage, would make excellent fodder for cows. And then, when wild oats are converted into silage, it is the means of carrying a lot of rubbish off the land. It may not be necessary or wise to feed cows entirely on ensilage, but I think it needs no argument to prove that a good feed of silage every day with what she can get in the stubble fields, or with a liberal supply of "cocky chaff" will be very helpful to her and profitable to her owner.

Rainfall for 1900, 6·71in. from January 1 till July 31.

Maitland, August 4.

Present—Messrs. H. R. Wundersitz (chair), A. Jarrett, C. G. F. Heinrich, P. Treasure, W. Wilson, Thos. Bowman, W. Bowey, J. Kelly, J. Smith, J. Hill, and C. W. Wood (Hon. Sec.).

PURCHASE OF BULL.—Members discussed breeds of bulls for dairy purposes. The majority favored the Holstein, but others would prefer an Alderney. It was resolved to inquire as to prices of Holstein bulls.

EXPERIMENTS WITH SEEDS.—The Chairman in particular and several members have tried the various seeds sent out by Central Bureau, and came to the conclusion that most of them were not suited to this locality. A few sweet and water melons were the exception, and these are not generally grown. One or two members stated that the seeds were too old, or had lost the germinative power. One member said, as his seeds did not germinate he sent to the seedsman for a small supply, which grew. [All seeds sent out from Central Bureau

office were new and sound, and wherever the soil, climatic, and other conditions and treatment have been suitable they have grown. In several cases the new introductions have been reported as excellent. But, after all, climate, soil, and treatment have everything to do with the success or failure of experimental and other cultivation.—GEN. SEC.]

Eudunda, August 7.

Present—Messrs. A. M. Twartz (chair), C. Wainwright, and W. H. Marshall (Hon. Sec.).

ATTENDANCE.—Hon. Secretary reports that the meeting called for July 8th was attended only by himself and Mr. Wainwright, and therefore lapsed. [Too bad altogether.—GEN. SEC.]

EXHIBIT.—Mr. Twartz tabled two bundles of Purple Straw wheat, over 3ft. high and in ear. He has 120 acres of similar growth.

Brinkworth, August 2.

Present—Messrs. S. Auger (chair), C. Ottens, H. J. Welke, W. Welke, A. W. Morrison, W. H. Pearce, G. Freebairn, A. L. McEwin, W. Wundke, J. Graham, J. Stott (Hon. Sec.), and several visitors.

RURAL INDUSTRY AT PUBLIC SCHOOLS.—This subject was well discussed, and the members were on the whole not in favor of the system, as so many of the teachers had little or no knowledge of practical agriculture. A number of the members were of opinion that the State was already attempting too much in the way of mechanical education. [Teachers, even, must have a period of probation, but in time will become proficient. The system has answered exceedingly well in France and in various places on the continent of Europe and why not in Australia?—GEN. SEC.]

VISIT TO HOMESTEAD.—This meeting was held at the residence of Mr. C. Ottens, members inspecting the crops, outbuildings, stock, implements, &c., after which they were entertained by Mr. and Mrs. Ottens, who were accorded a vote of thanks for their services. The manured crops were found to be very much better than those unmanured.

RAINFALL.—The rainfall for seven months, at Condowie, has registered 8.67ins., being 1in. more than to same date last year.

Cherry Gardens, August 14.

Present—Messrs. T. Jacobs (chair), G. Hicks, H. F. Broadbent, J. Metcalf, J. Potter, J. Richards, T. Paltridge, G. Brumby, and C. Ricks (Hon. Sec.).

FEED FOR COWS.—In reply to question whether it was better to feed bran and chaff to milking cows dry or damped, members favored the latter.

BONEDUST.—The Chairman preferred to broadcast bonedust, as it was more widely distributed and encouraged the roots to extend over a larger area of ground than if drilled in.

SALT AS A FERTILISER.—Mr. Potter stated that a neighbor applied 1½cwt. common salt per acre to his wheat crop. This land had previously failed to produce a decent crop, but the wheat was looking splendid. This seemed to show the land required salt, and it was interesting to know that the grower had used salt upon the recommendation of the Branch. Mr. Paltridge asked

if salt applied to brier roots after the plants had been cut below the surface with a grubber would destroy them. Members thought if sufficient salt were applied it would have the desired effect. [But what about the grass, &c., expected on the land if sufficient salt to destroy the brier roots and suckers is applied?—GEN. SEC.]

FRUIT-GROWING.—Members reported that most growers in this district were increasing the area of their fruit gardens.

Wilson, August 11.

Present—Messrs. W. H. Neal (chair), R. Rowe, H. Ward, H. T. Grossman, H. Need, T. Barnes, J. H. Gill, T. Matthews, and A. Canning (Hon. Sec.).

SEED EXPERIMENTS.—Members reported that the very dry seasons experienced had prevented any real success being obtained with seeds distributed by the Branch.

BACON-CURING.—This subject was well discussed. Mr. Rowe thought bacon was improved by a good washing after having been in salt for nine days, then hung for twenty-four hours, and rolled; Mr. Neal considered three weeks' curing sufficient for hams. Most members favor dry salting.

Port Germein, August 11.

Present—Messrs. G. Stone (chair), W. Broadbear, D. Thomson, E. McHugh, W. Crittenden, J. K. Gluyas, E. G. Blesing, A. Thomson, W. Head, and A. H. Thomas (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's annual report showed that the average attendance at the nine meetings held during the past year had only been five members, and he greatly regretted that the members had taken so little interest in the Bureau work. The retiring officers were thanked and re-elected.

DAIRY BULLS.—The question of purchase of pure-bred Ayrshire bull was discussed, and decision postponed pending receipt of further particulars *re* assistance from the department.

EXPORT OF LOW-GRADE BUTTER.—Mr. G. S. Thomson, Dairy Instructor, recently paid a visit to this district, visiting a number of farms and delivering practical addresses on dairying. Mr. Thomson mentioned the dangers attending the industry in the export of inferior butter, and emphatically condemned the packing of inferior butter in boxes branded with misleading and inaccurate descriptions. He also explained the steps taken by the department in regard to this matter. [See another part of this month's issue.—GEN. SEC.] At both meetings it was unanimously decided to support the departmental officers in their efforts to protect the buttermakers and good name of South Australia.

Mount Compass, August 11.

Present—Messrs. M. Jacobs (chair), W. Gowling, S. Arthur, R. Peters, C. S. Hancock, A. J. Hancock (Hon. Sec.), and one visitor.

SEASONABLE OPERATIONS.—Plant onions; sow carrots, parsnips, beets, mangolds, and field peas. Prepare ground for potatoes.

MANURE FOR POTATOES.—After full consideration, members concluded that their experience has shown that bonedust has proved itself the best manure in this locality.

Bute, August 4.

Present—Messrs. W. S. Sluggett (chair), W. H. Sharman, A. Schroeter, H. Shroeter, E. Ebsary, W. Hamdorf, D. Green, S. Lamshed, R. C. Commons, M. Stevens, W. Langsford, and A. Sharman (Hon. Sec.).

- SEEDS.—Mr. Green had found the Japanese climbing cucumber had done very well with him, and he had saved seeds for members.

FIELD TRIAL AND SHOW.—The combined Northern Yorke's Peninsula Branches Show and Field Trial of Agricultural Implements was held in Mr. Sharman's paddock, near Bute, on August 11. Owing to an agreement made between the importing machinery firms not to exhibit at shows, &c., there was very little competition in these lines. There was a fair representation of draught stock, a few light horses, two seed and manure drills owned by farmers ("Superior" first, and "Farmers' Favorite" second), four ploughs, and a few miscellaneous articles. The affair was not as satisfactory as it was wished to be.

Mallala, August 6.

Present—Messrs. G. Marshman (chair), H. B. Moody, S. Temby, A. F. Wilson, J. McCabe, J. Jenkins, A. Moody, G. W. Bischof, W. Temby, R. Butler, T. Nevin, W. R. Stephenson (Hon. Sec.), and three visitors.

STOCK FOR FARMS.—Mr. McCabe read a paper on "Stock for farm purposes" to the following effect:—

Much care, thought, and good management are required in order to be successful with farm live stock. Labor and expense in connection with their keep and management are matters that must be carefully watched and considered. The nature and character of the farm was an item that should be taken into account. It was highly desirable to have a reserve of food sufficient for a year's supply of the stock. As horses take three years to reach their period of usefulness it is necessary to keep a full supply of good food for them. Those who keep sheep should not have many of other classes of stock, and the fences should all be sheep-proof.

Mr. Butler said it was necessary to have cheap land and to always use a good sire. It would pay best in this locality to keep fewer sheep and fatten for the Adelaide and London markets. He was afraid horse-breeding would not pay for sale, but he believed that farm horses would be extremely scarce in time. Wheat-growing would probably pay better in this district than stock-raising. The Hon. Secretary preferred Jerseys to any other breed, but found that many people favored the Durhams. Mr. H. B. Moody said medium draught horses were most servicable, but the heavy horse is also a necessity. Horses had greatly deteriorated. A good sire is of supreme importance. The Shorthorn cattle were the best, and he believed it would pay in the near future to breed them. He preferred Merinos to any other breed of sheep. Mr. W. Temby said there was always a good sale for heavy draught horses. Every farmer should breed at least two or three foals each year. Good brood mares were very scarce in the district. He could breed better horses than he could purchase. The Jersey cow was the most profitable. Cross-bred sheep were most profitable for marketing. He could make 3s. per bushel for wheat fed to his pigs. Mr. A. Moody said it was necessary to keep Merino sheep in order to get a suitable cross. It was important to get evenness of wool. Mr. Bischof advocated breeding good stock, and get the best possible of all kinds of horses. The Merino is the best class of sheep. Mr. Jenkins prefers the medium draught horse, as more generally useful and durable than the heavy animal; but the heavy horse is necessary where there is heavy work to do. The Chairman liked a good strong team, but admitted that the medium horse will do more work of an ordinary nature, such as ploughing.

Port Broughton, August 6.

Present—Messrs. R. W. Bawden (chair), G. Pattingale, W. Tonkin, A. Dolling, W. R. Whittaker, H. H. Whittle, S. M. Bawden.

BRANCH CONFERENCE.—A conference of Branches of the Agricultural Bureau has been arranged to be held at Port Broughton in February next.

OFFICERS.—Messrs. R. W. Bawden and Jas. Barclay were re-elected Chairman and Hon. Secretary respectively for ensuing year, and were thanked for past services.

Gladstone, August 4.

Present—Messrs. C. A. Gallasch (chair), J. Rundle, J. Shephard, W. A. Wornum, C. Goode, G. M. Growden, and J. Milne (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary reported that during the past year nine meetings had been held, with an average attendance of ten members. Only one paper had been read, but at most of the meetings profitable discussions had taken place. Messrs. W. A. Wornum, J. A. Gallasch, and C. Goode were elected Chairman, Vice-Chairman, and Hon. Secretary respectively for ensuing year, a vote of thanks being accorded to the retiring officers. Special mention was made of the work done by Mr. Milne, who has held the position of Hon. Secretary for the past eight years.

Petersburg, August 18.

Present—Messrs. W. Miller (chair), E. Palmer, F. W. Sambell, J. M. Cadzow, S. Bottrill, H. Earle, W. Waters, and J. Wilson (Hon. Sec.).

DAIRY BULLS.—It was unanimously resolved that the Branch approves of the offer of the department to subsidise amounts raised by the Branch for the purchase of a pure-bred bull of approved dairy strain. It was thought that the Department might well pay the rail charges on these animals, as it was a heavy tax on the purchaser. The cost of bringing a bull from Adelaide to Petersburg was about £4. It was decided that, as far as this district is concerned, it is not advisable to extend the principle to other stock.

SEED EXPERIMENTS.—Members reported that owing to the drought and grasshoppers seeds received from Central Bureau had not proved successful.

Benmark, August 9.

Present—Messrs. F. S. Wyllie (chair), J. Forde, C. Millar, S. R. Cox, and E. Taylor (Hon. Sec.).

EXPERIMENTAL ORCHARD.—The Hon. Secretary reported that no further communication had been received with respect to establishment of an experimental orchard. Professor Hilgard's bulletin on treatment of alkali soils was further discussed.

Balaklava, August 11.

Present—Messrs. P. Anderson (chair), J. Vivian, E. Hams, W. Smith, A. W. Robinson, W. Tiller, Jas. MacLachlan, jun., and E. M. Sage (Hon. Sec.).

WINTER GREEN FEED FOR SHEEP.—Referring to paper read by himself at the June meeting of this Branch, Mr. Robinson stated he had visited a farm in the district and inspected a paddock of seventy acres of stubble land that

had been scarified in with barley for feed for sheep. For seven weeks 410 sheep (ewes and lambs) had been grazed on the paddock during the day time, and the paddock would apparently last some weeks longer. The sheep were taken off at night and not put in the paddock in the morning until the feed had got fairly dry after the night dews. He had just commenced to feed off the barley he had sown; it had come on well, and would be splendid feed in the spring for his sheep.

SEED EXPERIMENTS.—Most of the experiments carried out of late years have failed owing to the dryness of the spring and early summer. Seeds that have grown have failed to mature. The Hon. Secretary had Kaffir corn do much better than other sorghums, but very few seeds set.

Kadina, August 2.

Present—Messrs. T. M. Rendell (chair), D. F. Kennedy, F. H. Warren, M. Quinn, H. Johnson, S. Small, S. Roberts, D. Taylor, and J. W. Taylor (Hon. Sec.).

BRANCH SECRETARIES.—It was resolved that the General Secretary be asked to publish in the *Journal* the fact that a member of this Branch has suggested the payment of a small annual sum by the department to Branch Secretaries as a recognition of services rendered. Other Branches would then be in a position to discuss the suggestion. Mr. Small thought £2 or £3 per annum should be paid. [This would require an additional annual grant from Parliament of £216 or £324, and each Hon. Sec. would necessarily be a paid officer. The great majority of our most active and zealous Hon. Secretaries would be very poorly paid at the rate of £2 or £3 per year, and will do a great deal more from a spirit of patriotism than for such miserable pay as that proposed. —GEN. SEC.]

MANURES.—A short discussion took place on quantity of manure to use per acre for wheat.

OFFICERS.—Messrs. T. M. Rendell and J. W. Taylor were re-elected Chairman and Hon. Secretary for the ensuing year.

Pine Forest, August 14.

Present—Messrs. R. Barr, jun. (chair), A. Inkster, E. Masters, J. Phillis, W. H. Jettner, F. Masters (Hon. Sec.), and a number of visitors.

CONFERENCE.—Port Broughton Branch desired co-operation in holding a Conference of Northern Yorke's Peninsula Branches there next February. Consideration postponed.

SEED EXPERIMENTS.—Nearly all seeds sent on by Central Bureau have failed, or have succeeded for a season and the seeds have been lost later on through drought. The Chairman reported favorably of Lord Greig (?) and Icing water melons, and Royal George piemelon. Natal Red-top grass, Red Imphee, and Seradilla (*Ornithopus sativus*) in favorable seasons are valuable fodder plants. Mr. Phillis said he had allowed his seeds to run out, as he considered them worthless.

BULLS.—An endeavor is to be made to secure service of bull now at Port Broughton, where it is no longer wanted.

THRASHING MACHINE.—Mr. Jettner said a complete threshing plant would be worked in the district next year if sufficient inducement is offered, and arrangements should soon be made. The company would charge threepence per bushel, for lots not less than 100 bush., for threshing, cleaning, and for stacking

the straw. The Chairman strongly recommended members to take advantage of the offer, if only as an experiment. It would be a good opportunity to put up strawstacks as a standby for drouthy seasons at small expense. He intended to reap and bind a large area of his crop for the purpose. Mr. Masters said it would not pay to purchase a string-binder to cut 30 or 40 acres for threshing, and doubted if sufficient binders could be hired in the district for all to cut about that area, and many farmers could not wait long for the return from their crop. The Chairman said it would be easy to get over those difficulties, as two or three enterprising men would soon purchase binders and earn the money to pay for them by cutting crops for their neighbors, if the work were assured. It was decided to canvas the district and endeavor thus to secure the presence of the threshing plant.

SOCIABILITY.—Mr. and Mrs. W. H. Jettner entertained the members, their wives, daughters, and several other friends at tea; and afterwards a very pleasant evening was enjoyed. Thanks were accorded.

Norton's Summit, August 11.

Present—Messrs. J. Jennings (chair), J. J. Bishop, J. Pellew, J. Hank, A. Smith, and W. H. Osborn (Hon. Sec.).

OFFICERS.—Past officers thanked and re-elected.

SEED EXPERIMENTS.—Members have failed to find a single good variety amongst the seeds sent on by the Central Bureau, with exception of a tomato grown by Mr. Bishop. Unless seed is really good it is of no use to market gardeners. Several different varieties have proved the result in sowing the contents of one packet. [New varieties from seed are very liable to "sport," or revert to original stock. The Central Bureau never purchases any seeds for trial unless they have been strongly recommended, either by our own colouists or in the foreign catalogues. Would it be better to leave the introduction of such seeds to the farmers and gardeners individually, or to introduce them through the Bureau and have them tried widely and at once?—GEN. SEC.]

BULLS.—Members consider that two years is sufficient time for a bull to remain in use in any locality.

Johnsburg, August 11.

Present—Messrs. G. H. Dunn (chair), F. W. Hombsch, F. W. Smith, T. A. Thomson, P. Callaghan, T. Potter, M. L. Read, L. Chalmers, W. McRitchie, and T. Johnson (Hon. Sec.).

RAIL FARES TO CONGRESS.—Question raised whether the General Secretary's certificates could be transferred to another member if the member to whom it is issued finds it impossible to avail himself of it. [The only course is to return the certificate to the General Secretary, and the Hon. Secretary to nominate another member as delegate to Congress. No other person whatever can be authorised to issue certificates or to alter or vary them in any way.—GEN. SEC.]

FERTILISERS.—Chairman wishes to know whether commercial fertilisers will depreciate in value if left for some weeks in a dry place or in the open air, but kept quite dry. [Any strong-smelling fertiliser will lose more or less of its strength and value if kept for a time, and the warmer the position the stronger will be the odor and the greater the loss in its value. Certain kinds of fertilisers may deteriorate to some extent by absorption of moisture and by caking.—GEN. SEC.]

SEED AND FERTILISERS.—Question—Will seed wheat be injured by lying in close contact with a fertiliser in dry soil? [In some cases it has been asserted

that superphosphate has prevented the germination of seed wheat that has lain dormant after sowing, owing to absence of rainfall. This has been denied by others, but both statements may be correct, owing to variations in the circumstances attending each case.—GEN. SEC.]

KING'S EARLY WHEAT.—The Hon. Secretary said there are complaints that King's Early Solid-straw wheat runs prematurely to ear and does not tiller. In most cases it has only one stem, and the crops are very thin. It was thought the late season had something to do with this, and that feeding down severely might remedy this defect. Later and thicker sowing was also suggested.

SEED EXPERIMENTS.—Mr. McRitchie reported favorably of Long Yellow carrot, King Humbert tomato, Homerus watermelon, Bush marrow, Japanese climbing cucumber, Dhurra, Kaffir corn (headed well, but was destroyed by locusts), Improved red beet, white beet, and Burpee's Early All-head cabbage. Messrs. Thomas had grown the latter cabbage, and spoke highly of it, and many plants had been distributed to members. Messrs. Thomas spoke well of Bartlett's Crossbred wheat, and are growing some for re-distribution by the Bureau. Mr. Read reported favorably of Japanese climbing cucumber. Where water could not be applied most of the seeds above mentioned failed, owing to the prolonged drought. Only a few people can find water for their gardens, and those have taken great pains to produce results. In several cases the locusts destroyed the crops when they were fairly advanced.

Yorke town, August 11.

Present—Messrs. J. Koth (chair), C. Domaschenz, A. Jung, A. Anderson, C. H. Davey, and John Davey (Hon. Sec.).

FALLOW AND ITS TREATMENT.—It was agreed on by all members that fallowing should be done early whilst the land is wet, and the plough should be stopped when the land gets dry, as dry ploughing in the spring time does not give as good results as when done in the fall. It is best to feed off oats and other vegetation before the plough, and if there is much stubble run the horse-rake over it. If the stubble is ploughed under it will cause much trouble to keep the land clean by cultivation. Fallow can hardly be kept clear of weeds by running sheep on it, even to the verge of starvation, because oats and cockspur will produce seeds in spite of all. From 4 in. to 5 in. is deep enough to plough fallow on the Peninsula.

Davenport, August 9.

Present—Messrs. J. Holdsworth (chair), A. McDonald, J. E. Lecky, W. G. Pryor, T. McDowell, and J. Roberts (Hon Sec.).

PAPER.—Mr. Lecky read a paper on "How to Make Country Life More Attractive," and an animated discussion followed.

Tatiara, August 4.

Present—Messrs. Thos. Stanton (chair), T. Hall, R. Scown, C. H. W. Wiese, A. D. Handyside, F. Smith, and W. E. Fisher (Hon Sec.).

SEED EXPERIMENTS.—Mr. Scown has only one plant of true tagosaste of good size, two years old; another is growing on sandy loam near the railway, and is in flower. Cow peas do well here, but severe frost prevented seeding to any extent. All-head cabbage is one of the best, and very profitable if well cultivated. Seeds of most kinds from Central Bureau are generally too late in arrival.

STALLIONS.—Referring to proposal before the Parliament to tax entire horses used for hire, Mr. Handyside was in favor of a licence fee; but it should not be so high as £10 per annum. The Hon. Secretary did not think Branches of the Bureau should be the media through which the licence fees should be collected. Mr. Smith and other members contended that the fees could better be collected by municipalities and district councils, but if the agricultural societies were to carry out their duties properly there would be no necessity whatever for the proposal. It was decided that, in the opinion of this Branch, all stallions fit for service and travelling for hire in any part of the colony should be examined and passed, if sound, by a duly qualified inspector, and should be subject to an annual fee of £5.

Mount Bryan East, August 11.

Present—Messrs. T. Wilks (chair), A. Pohlner, W. Bryce, E. T. Prior, W. Dare (Hon. Sec.), and one visitor.

BULLS.—Members are in favor of Branches purchasing pure-bred dairy bulls for improvement of dairy herds by subscriptions subsidised by the State pound for pound raised.

SEED EXPERIMENTS.—Owing to drought and locusts none of the seeds sent to this Branch by the Central Bureau have proved successful.

WARTS ON HORSE.—Mr. Pohlner wished to know how to remove warts on a horse. They had been growing for two years. [Tie a piece of catgut or twine tightly around the base of the wart and it will fall off in time.—GEN. SEC.]

Strathalbyn, August 13.

Present—Messrs. M. Rankine (chair), R. Watt, B. Smith, P. Cockburn, H. H. Butler, W. M. Rankine, W. J. Tucker, G. Sissons, and J. Cheriton (Hon. Sec.).

DAIRYING ON FORTY ACRES.—Mr. P. Cockburn read a paper on "Dairying on Forty Acres with Thirteen Cows," as follows:—

The weather conditions of an average season in this district are so favorable that I think I am not going to speak about the impossible, but shall endeavor to point out how it can be done. First I mean thirteen cows in milk, the dry stock being sent to inferior pasture. If the owner thinks that keeping the dry stock on his land would be more profitable than paddocking them let him do so. I should recommend them being sent to the lakes or the river; this would not be inferior pasture, but superior, and a good change. I would first sub-divide my land into four paddocks, ten acres each. No. 1 would be fallowed in June, say the year 1900; also No. 2 when the first rains falls in 1901; No. 1 would sow with rye, oats, and barley—this would be cut about the first week in September; the means of harvesting, with the binder and carts following the machine and taking it to the ensilage pit. When the pit is full plough the place where the stuff has been taken off, and by this time the ensilage will have gone down, and so proceed until the whole paddock has been taken off; thus we have ten acres of fallow for treating the same way the following year. The cows would be stabled every night during the winter, or I might say nine months in the year, for the sake of the manure which would always go to No. 1 paddock where the ensilage crops are grown. No. 2 would be fallow, which I would sow the third week in April with wheat. I should put it in with a drill with about 2cwt. of superphosphate according to the richness of the land, and not harrow after the drill unless absolutely necessary. If we examine the land that has been harrowed after the drill we shall find that where the horse has placed its foot on the wheat the grain has a hard piece of soil to get through. This is very plain if the wheat has been sown on a moist soil and the sun comes out and dries it, the place where the horse placed its foot is as hard as possible, and the wheat will not come through. When the crop is up, rolling the same way as it is drilled should be done if possible. Harrow with a light harrow across the drills; this will leave a powdery surface on the soil, which is very desirable in summer. Harvest is the next thing. I should reap and bind about seven acres first; the remaining three be left till later

on, that is to say it should be left until just yellow. Having cut seven acres it should be stacked as quickly as possible, and the stacks should not be big, the time that it should be left in the field varying very much. When stacking mix some rough salt with the hay, put the salt in a barrel of water and apply with a can, the mixture being very salty. The hay having been fixed up the three acres is the next thing; this should be cut with a binder and headed, all the chaff and straw being saved. I have not said anything about No. 3; this would be fallowed in June following seeding and put in the following year. No. 4 would have the cows running on it. The second year No. 1 would be treated the same way as the first year; No. 2 would be the cow paddock; No. 3 would have the wheat on it; and No. 4 fallow. The third year No. 1 same, No. 2 would be fallow, No. 3 cows, No. 4 wheat, and so on. I hope that I have shown clearly that this is possible. Not only would this be a man's income, but there would be skim milk, the wheat from three acres, a portion would be sent to the mill for grist, the flour used for the house, bran for the cows, pollard for the pigs, and some of the wheat crushed for feeding pigs, fowls, &c. The labor required would be a small item, one man and a boy being sufficient. Implements required would be a double-furrow plough (8-inch furrows), harrows, and harness for two horses, the drilling, cutting, and binding the crop being done by contract.

COULTER V. DISC DRILLS.—Hon. Secretary prefers the coulter drills, as it leaves the seed bed more compact than the disc drill does, but would prefer a presser to either. All other members agreed that the disc or presser are best for land that has weeds, roots, or straw on it, as the coulter drill draws the land into heaps and requires much attention.

Arthurton, August 15.

Present—Messrs. W. H. Hawke (chair), J. Pearson, H. Baldock, T. Baldock, W. E. Hawke, and J. B. Rowe (Hon. Sec.).

HOMESTEAD MEETING.—Members met at the farm of Mr. J. Pearson, but the weather was too wet and rough to inspect the crops. The outbuildings are of a substantial character, mostly stone and iron, with two large underground tanks. There is a well-kept vegetable garden, with abundance of vegetables growing.

BULLS.—Members consider that this district is not at present suitable for dairying in a large way; but Mr. Hawke thought it would improve through the united use of phosphatic manures, and cattle would benefit from the more general use of iron, salt, and bonemeal, mixed and placed in boxes or troughs where the animals have free access. The Hon. Secretary said his experience showed that salt helps to increase the flow of milk. The members approved of the principle that Branches subscribing for purchase of bulls for improvement of the dairy herds of their districts should receive a subsidy of £1 for each £1 raised for that purpose.

Mundoora, August 10.

Present—Messrs. R. Harris (chair), W. D. Tonkin, W. C. Shearer, J. J. Vanstone, T. Watt, J. Loveridge, W. Mitchell, J. Blake, W. Aitchison, D. Owens, C. Button, Harold Torr, and A. E. Gardiner (Hon. Sec.).

THE CONFERENCE ON STANDARD BUSHEL.—After carefully considering the arguments forward at the conference between members of the Agricultural Bureau, farmers, country millers and buyers, and representatives of the corn trade section of the Chamber of Commerce, members could not do otherwise than agree with the decision arrived at. The standard of average quality of each season's wheat is fixed by samples of about seven-tenths of the crop, and that ought to be a fair average. If a fixed standard were adopted—say 64lbs.—and a generally rusty season were to occur, farmers would be put to great

loss. No doubt the average weight of each season's crop could be increased by extra cleaning, but at the present low prices for wheat it will not pay to do the work.

QUANTITY OF SEED TO SOW.—Some agents having stated that by use of the seed drills only half the usual quantity of seed should be sown, Mr. Aitchison wished to learn if thin sowing is advisable. Mr. Hains said his practice is to sow about 15lbs. less seed per acre than would be required in broadcast sowing. Mr. Vanstone's experience was similar. Last season he noticed that the plants perished—when the dry time came on at the ends where the drill crossed its work, thus putting on a double quantity of seed and fertiliser. Mr. Mitchell said some kinds of wheat, such as Early Para and Steinwedel, required to be sown almost as thickly as when broadcasted. Members recommend close observation for a few years to ascertain what quantity of each variety of seed wheat per acre will give the best results.

EARLY v. LATE SOWING.—After considerable discussion, it was concluded that it is a mistake to sow early-maturing wheats in the first part of the sowing season. The slow-growing varieties should be sown first. In this district there are crops of Early Para and other early sorts already out in ear through being sown too early.

Bowhill, August 18.

Present—Messrs. A. Dohnt (chair), W. Towill, J. Gregory, N. P. Norman, E. Drogemuller, J. McGlashan, J. Waters, F. H. Baker, F. A. Groth (Hon. Sec.), and two visitors.

WHEAT BAGS.—This Branch does not favor reduction in size of wheat bags from 4bush. to 3bush.

OFFICERS.—Officers were thanked for past services. Mr. E. Weyland elected Chairman, J. Gregory Vice-chairman, and F. A. Groth re-elected Hon. Secretary.

Carrieton, August 23.

Present—Messrs. J. B. Harrington (chair), N. Travers, A. Steinke, G. Martin, F. Kaerger, J. F. Fisher, and J. W. Bock (Hon. Sec.).

OFFICERS.—Messrs. J. B. Harrington and N. Travers were elected Chairman and Vice-chairman respectively, and Mr. J. W. Bock re-elected Hon. Secretary for ensuing year. The retiring officers were thanked for their services. Mr. J. F. Fisher tendered his resignation and was accorded a special vote of thanks for his services since the inauguration of the Branch, both as an officer and a member.

STALLION TAX.—Some discussion took place on this subject, with the result that a motion favoring an annual tax of £5 on every stallion over the age of three years was carried.

Minlaton, August 18.

Present—Messrs. J. Anderson (chair), T. Brown, J. Martin, J. McKenzie, S. Vanstone, J. D. Mayer, D. G. Teichelmann, M. Twartz, J. Bennett, Jos. Correll (Hon. Sec.), and one visitor.

DAIRY BULLS.—Considerable discussion took place on the question of proposal that the department should subsidise amounts raised by Branches for the purchase of pure-bred bulls. A majority of the members favored the adoption of the principle.

TREATMENT OF FALLOW.—Some discussion took place on the question of the working of fallow land. Some of the members had found it not advisable to work the fallow much during summer months, as it has a tendency to make the ground too loose. Keeping the weeds fed down by sheep was considered the better practice.

Dawson, August 11.

Present—Messrs. C. W. Dowden (chair), I. J. Byrne, A. J. Hooper, C. H. Meyers, and A. F. Dempsey (Hon. Sec.).

SEED EXPERIMENTS.—Various plants that had proved successful during the first few years after receipt of seeds from the Central Bureau have since died out, through drought and other causes.

RAINFALL.—The rainfall here from January 1st till August 11th was 3·30in.

Orroroo, August 17.

Present—Messrs. W. S. Lillecrapp (chair), W. Robertson, J. Moody, G. Harding, R. Coulter, E. Copley, J. Scriven, M. Oppermann, J. Jamieson, and T. H. P. Tapscott (Hon. Sec.).

BULLS.—Members prefer to have loan of bulls to Branches by the Department of Agriculture to any system of purchase by subscriptions with a subsidy.

Albert, August 18.

Present—Messrs. J. Wetherall (chair), J. Drogemuller, R. P. Barnett, R. C. Norton, R. C. Rasmussen, W. Farley, F. W. Stengert, E. E. Hoffman, A. Steinke, H. L. Smith (Hon. Sec.), and one visitor.

WHEAT BAGS.—After discussion, members decided that it would be advantageous to adopt 2bush. bags for wheat; but there was some dissension in favor of the 4bush. bag.

STANDARD QUALITY WHEAT.—Members are of the opinion that a fixed standard or grade of 63lbs. ought to be adopted for a bushel of South Australian wheat.

Riverton, August 11.

Present—Messrs. W. Hannaford (chair), D. Kirk, T. Gravestock, J. Kelly, M. Nash, W. Davis, A. S. Martin, M. Badman, H. A. Davis, and H. A. Hussey (Hon. Sec.).

IMPROVEMENT OF HORSE STOCK.—Mr. W. Hannaford read the following paper:—

In dealing with this subject I have found many difficulties in the way of proposing something practicable. There are so many side issues that one's sentiments and ideals are almost entirely the victims of the issues arising out of the necessities of every-day requirements. However, the high ideal of what we consider should mark the perfect horse is, when put into practice, the germ that leads to a general improvement.

The wild horse, as seen in the eastern colonies, cannot be said to deteriorate as an all-round animal, but he loses those characteristics which suit him for special purposes. In the wild state it is purely a survival of the fittest to live under the wild conditions. In the domesticated state, however, man cultivates the characteristics desired. The horse thereupon becomes a specialist, and as a specialist we have to deal with him. It appears to be an undeniable fact that our horses, taken as a rule, have lost a good deal of character. Several things have operated to bring about this result, including the low prices ruling during some years for all

kinds of horse stock ; the uncertainty of farming in our Northern Areas ; the over-production of light stock, and the low prices ruling for that class, together with the easiness of our soils to work, and the general depression through lowness in price of our staple products. These, with many other causes, have been factors to lower the standard of our horses. How are we to improve our horses? We have throughout the colony agricultural societies, assisted by Government bonuses or grants, holding show meetings where competition is invited ; but, unfortunately, in my opinion these shows are too numerous, and in many instances, as far as horseflesh is concerned, they do as much harm as good. The judges often have not the confidence of horse owners or the public either ; the result is that horses are given first and second prizes when they should not have a prize at all. What I mean by that is, the stallion may be a good animal in himself, but showing no defined characteristics of breed ; he is, in fact, a fine mongrel horse. He leaves the show ring a first prize horse, and he is patronised on the strength of the honors won, and put to mongrel-bred mares of all sizes. The result is a surplus of ill-bred animals.

I should like to see fewer shows held, and better ones. Judges for horses should be elected by the societies of the whole colony, and paid to judge at each meeting. All stallions should be judged in the district in which the owners intend to use them. They should be judged by points, passed by a veterinary surgeon, and, when being travelled for service, the person in charge should be compelled to carry a certificate from the judges and surgeon showing health and the maximum and number of points gained, also class and pedigree. To meet the necessary expenses that would be incurred by the societies, and to prevent in a measure the using of inferior horses at a low price, an all-round tax on stallions should be made. The first prize horse in each class and district to have the amount of its tax returned on condition that it serves thirty mares during the following season.

The result would be we could rely on breeding from healthy stock ; we would have the assistance of the best judges of the colony to guide us in the choice of a stallion. The breeder who wished to improve his stock could rely on enhanced value owing to the checking of inferior bred animals on the market, and practically a bonus would be given to the best horse in the district, with the connective advantages of a goodly number of foals. But there is one very important thing, and that is, we each must take a pride in our stock, and do the best we can with them. Many horses that should be good have been spoiled through neglect during their growing years. In a country like ours we cannot depend on the natural grass in all seasons. If we do, it means every few years a large number of undersized horses come to maturity. It is necessary to give justice if we desire satisfaction.

After discussion, members agreed that the true type of Clydesdale is too heavy for farm work here, and that a more active horse is required ; they favor the Suffolk Punch type.

STALLIONS.—The following motion was carried :—" That instead of Government subsidising so many shows, it would be more advantageous to import one or more Suffolk Punch sires and a few mares. The stallions could be loaned, or bought on the subsidy system of £1 for each £1 raised by subscriptions by the Branches of the Bureau. The mares could be kept at Roseworthy College until a few colts are raised for disposal on the same system." The following was also carried :—" That all sires travelling for hire should, each season, be examined by a veterinary surgeon, who should issue a certificate of health, &c., which must be produced at time of service. And every stallion exhibited at shows should be judged by points, showing class, general fitness, and health, and a certificate, showing maximum points and the number of points gained by the stallion shall be issued to the owner."

Pyp, August 15.

Present—Messrs. J. Harrington (chair), J. Bowes, G. Napier, W. Axon, J. Napier, E. Robinson, C. Billett, H. Mills, and W. C. Rogers (Hon. Sec.).

OFFICERS.—Officers thanked. Mr. J. Harrington elected Chairman, and W. C. Rogers re-elected Hon. Secretary.

VEGETABLES.—Members find that sheepdung is the best manure in the vegetable garden.

PEACH APHIS.—Mr. Axon showed branch of peach tree covered with peach aphis, and was recommended to spray with resin wash. [Tobacco and soap

decoction is better. The insects come up from the roots during August, and attack the bark on the under side, and later on infest the young growth. Make the decoction by boiling 3ozs. tobacco stems (waste from the factory), or 1oz. stick tobacco with 3ozs. soap in each gallon of water. Lay the roots bare for 9in. from the trunk of the tree, and swab the roots all around with the decoction. Do not return the soil for a fortnight, and then use new soil. If fresh horsedung is available, use that to fill the hole. The aphides on the branches should be well sprayed with the decoction at once, and again within seven days. This treatment will probably destroy them all.—GEN. SEC.]

Bakara, August 10.

Present—Messrs. R. Barrow (chair), R. Wilson, H. R. Hayward, J. Bates, J. Roy, J. E. A. Seidel, A. Herrmann, A. Lehmann, E. Wall, E. J. Dietrich, and F. E. H. Martens (Hon. Sec.).

HOMESTEAD MEETING.—This meeting was held at Mr. Seidel's farm, where they inspected the experimental plots of Majestic, Silver King, Ranjit, and Marshall's Hybrid wheats, which were doing well. They also were pleased with the well-kept vegetable garden, which had nice crops, despite the dry weather.

FIELD TRIAL.—It was decided to hold a field trial of stump-jump ploughs at Mr. Roy's farm on October 4 next.

Koolunga, August 9.

Present—Messrs. T. B. Butcher (chair), J. Jones, J. Sandow, R. Lawry, J. Butterfield, E. J. Shipway, J. Button, R. Palmer, W. J. Jose, and G. Pennyfield (Hon. Sec.).

HOMESTEAD MEETING.—This meeting was held at Mr. Shipway's farm. The crops were forward, looking strong and healthy. Commercial fertilisers were used, and a few strips left without manure. The difference between manured and unmanured was very marked. Mr. Shipway finds it profitable to keep a few sheep. A windmill keeps the troughs in four paddocks constantly full of water. The vegetable garden had excellent crops of several kinds, and there was a choice lot of flowers growing. The improvements on the farm are substantial and well arranged. Tea and supper were provided, and the members thanked the host and hostess.

BULLS.—A majority favor purchase of pure-bred dairy bulls by Branches, with a State subsidy of £1 for each £1 raised by subscription for the purpose.

EXPERIMENTAL SEEDS.—Several members said the Golden Return and Dart's Imperial wheats received from the Central Bureau were doing well. It was resolved to give certificates for the best experimental plots this year.

TREE-PLANTING.—Members agreed that, in the north especially, farmers and others should plant a few trees every year. Their value as shelter and shade for live stock as wind breaks, for timber, ornament, and their influence upon temperature, humidity, &c., were alluded to. Several members have found that frost destroys more of the young trees than are killed by heat and dry weather, and they advocate planting early, or else waiting until the frosty weather is over.

[JULY 12.—At a meeting held July 12, all the members except Mr. J. Freeman were present. There were twelve visitors, and Mr. E. Pridham, of Lochiel, read a paper on "Fixing a Standard Price for Wheat."]

Finniss, August 6.

Present—Messrs. T. Collett (chair), J. Chibnall, A. E. Henley, W. W. Heath, A. Green, H. M. Wallenstein, S. Eagle, and S. Collett (Hon. Sec.).

BULLS.—Members will try to raise sufficient money to secure subsidy of £1 for each £1 subscribed for purchase of a pure-bred Jersey bull, for improvement of the dairy herds of the district.

SEED EXPERIMENTS.—Mr. T. Collett tabled sample of White Milan turnip, which he considers a very good variety, raised from Central Bureau seed. He also reported on following, received from same source:—In 1899 sowed twelve sorts of seeds, but the season was too dry. Cocozelle marrow was a good variety, but matured no seeds; Helios tomato is well worth cultivating; Best-of-All and Pole Beans are both very good, and seeds have been saved for further propagation. The Hon. Secretary reported very poor success generally last season, owing to dry weather, and the seeds failed to germinate. They are doing better this season. Last year the Melvor watermelon proved a beauty, and the Cocozelle marrow was good, but failed to produce much seed; the Lettuce-leaved turnip proved a good early variety.

Naracoorte, August 11.

Present—Messrs. S. Schinckel (chair), E. C. Bates, J. Wynes, H. Buck, A. Johnstone, and J. D. Smith.

SEEDS.—Members promised to bring up reports on seeds sent to them from Central Bureau.

BULLS.—Decided that this Branch is not in favor of subsidy system for purchase of pure-bred dairy bulls for this district.

BIRD PROTECTION.—Members were anxious lest the Bill now before Parliament should propose to protect birds that are injurious to cultivators of the soil, and were pleased to learn that parrots of all kinds were on the unprotected schedule.

HOME INDUSTRIES.—Mr. Buck tabled a fox skin and kangaroo skin tanned by himself in leisure time. These were pronounced by tanners to be very well done. He also showed samples of spikes, nails, &c., made by himself from waste wire, old horseshoes, and pieces of old iron. His forge and tools, &c. had cost £8, and he advised all farmers to get a forge and do odd jobs for themselves.

Clarendon, August 13.

Present—Messrs. J. Spencer (chair), R. Hilton, W. Spencer, J. Piggott, J. Wright, W. Henley, E. Dummill, A. Harper, H. Payne, and A. L. Morphet (Hon. Sec.).

BULLS.—A special meeting to be called to decide whether to obtain a Jersey or an Ayrshire bull for improvement of the dairy herds of this district.

EXPERIMENTAL SEEDS.—Most of the seeds supplied by the Central Bureau for trial failed to grow. No cause assigned. The few that did grow were considered to be inferior to varieties already grown here, and seeds were not collected.

QUESTIONS.—It was decided, in reply to questions put through the box, that Essex pigs are the best to keep for profit. What is the best smothering crop for soursops? [Probably white mustard sown thickly, ploughed under, and sown again would be the best.—GEN. SEC.]

Crystal Brook, August 11.

Present—Messrs. J. C. Symon (chair), W. Hamlyn, G. Davidson, E. Dabinett, W. J. Venning, P. Pavy, A. Hamlyn, and F. S. Keen (Hon. Sec.).

STANDARD SAMPLE OF WHEAT.—Mr. Venning read extracts from paper prepared by himself on this subject.

FIELD TRIAL.—Committee was appointed to arrange for site for trial of reapers, harvesters, and winnowers.

Gumeracha, August 13.

Present—Messrs. W. Jamieson (chair), W. J. Hannaford, W. V. Bond, W. Cornish, Dr. Stephens, W. A. Lee, J. Monfries, and A. E. Lec.

SEED EXPERIMENTS.—Members had not been successful with seeds received from Central Bureau.

RABBITS.—Dr. Stephens gave an address on the rabbit question, and strongly advocated use of strychnine dissolved with acid and mixed in water. It was generally thought that there would be no difficulty in keeping the pest down in this district if wholesale and simultaneous poisoning were undertaken.

Inkerman, August 28.

Present—Messrs. W. Board (chair), D. Fraser, W. Fraser, J. Lomman, C. E. Daniel, and W. A. Hewett (Hon. Sec.).

EXPERIMENTS WITH SEEDS.—Owing to bad seasons nearly all the seeds of vegetables and all the grasses sent out by the Central Bureau have failed to grow. Six varieties of wheats have been sown by the Hon. Secretary side by side with three local varieties, and they all are strong and healthy.

TICKS.—The Chairman asked whether it is at all probable that the fowl tick is carried about by the sparrows? [This is a conundrum I cannot answer; but have never seen or heard of such being the case.—GEN. SEC.]

PREMATURE WHEAT.—Mr. Daniel said his wheat is out in ear already. Members think it will probably turn out better than the backward crops.

AGRICULTURAL SHOWS.—At the previous meeting Mr. W. Fraser read the following paper:—

A great deal is often said and will continue to be said as to the advisableness or otherwise of holding so many small country shows. To some there seems to be no question whatever that there are far too many. Some would even say that the Government subsidy should be curtailed, and thus crush the small shows for the benefit of the larger ones. "Let us have few shows and good ones," some will tell us. This argument may sound all right from a theoretical point of view, but how will it come out in practice? Let us consider some of the effects that will assuredly accrue from such an alteration. Because a man may be farming in a small way, or a person carrying on a business in a small way, is no reason that they should not enjoy the same proportionate advantages as others who may be doing business in a much larger way. Are not both essential, as they are mostly regulated by what the surrounding locality will warrant? Then such an alteration will have a tendency towards centralisation, which is by no means desirable for the well-being of a country.

I do not, at present, attempt to discuss the point whether or not shows are a benefit. We take that for granted. The question is should they be reduced in number and held in favorable centres?

Some time ago I noticed a paper that was read at the Naracoorte Branch of the Agricultural Bureau, in which the writer contended that there should be one large show in the South-East, to be held at different townships each year. In that case each place would require a show-ground to be fitted up at a very great cost—over £1,000—to be used once in about ten years. The writer also remarked that with the advent of federation, and the border barriers being a thing of the past, Victoria would, in all probability, be a large exhibitor. Is not such a system question-able? Instead of giving prizes to exhibits that would only be seen on show day, would it not be better to give it to the best that could be produced in the district?

One of the results of holding fewer shows in the country (say, half a dozen, as some suggest) would be that a few tip-top professional exhibits would be taken round to all the shows, as the prize money that would be offered at such a large show would be well worth going for. So that, in all probability, a great many of the first prize exhibits in Adelaide would be taken round to all the shows, as that show is held before the majority of country ones; whereas under the present system, in most cases, the prizes go to local exhibits. Of course some make a practice now of following up the shows, but I think it would be increased under the proposed system.

It is quite impossible to raise exhibits in poor districts that could fairly compete with those grown in a more favorable locality. A person may have a really creditable exhibit for a dry district that would require as much brain and muscle to raise it as would be required to raise a far superior exhibit when conditions are more favorable.

Then let us look at it from a social point of view. Show day affords an opportunity for meeting friends. Many look forward to the show for a day's outing and for interchange of social feeling. If many of the shows were cut off, hundreds of people would not have an opportunity of seeing a show at all. I am quite aware that by advocating the continuation of small shows I am going against the opinion of a great many, amongst whom is Professor Lowrie; still, wise men are liable to err at times. One reform that is needed is that trials of agricultural implements should be insisted upon before awarding prizes. If show societies and the Bureau could be united I think much good would result, as the support given to each by the Government put together would do a great deal. One point where the societies lack is that very little is done from the holding of one show till the next, by way of practical experiments. This the Bureau could supply with the great advantages offered to its members. A misfortune that besets the societies is that they are run individually, and a spirit of antagonism exists instead of each regarding the other's interests. By being united dates could be fixed so that they could hold their shows in rotation instead of clashing with each other, as is frequently the case.

After brief discussion it was agreed that the present system of holding shows was preferable to reducing the number.

REWARD FOR THE DISCOVERY OF PHOSPHATES.

Office of the Minister of Education and Agriculture,
Adelaide, January 20, 1900.

Rewards are hereby offered for the discovery and working within the colony of a deposit or deposits of marketable mineral manure, as under:—

1. £500 if found on Crown lands; £250 if found on freehold lands.
2. If found on Crown lands, the discoverer will be entitled to a lease of the land upon which the discovery is made, in terms of Part VI. of the Crown Lands Act of 1888, providing for a lease of 640 acres for twenty-one years.
3. The above rewards will be payable to the discoverer at the Treasury, Adelaide, on the certificate of the Professor of Agriculture that the following conditions have been complied with:—
 1. That the deposit is easily accessible, and within a reasonable distance of a railway or seaport, and not within twenty-five miles of any discovery on account of which any bonus has been paid.
 2. That the deposit is sufficiently abundant, and is available at a price which will allow of it being remuneratively used for agricultural purposes.
 3. That the product is of a good marketable quality, averaging not less than 40 per cent. of phosphate of lime, provided, however, should a phosphate of a lower average composition be discovered, the Professor of Agriculture may recommend that a portion of the reward be granted.
 4. The terms of payment will be $\frac{1}{5}$ (one-fifth) on the production of the first 200 tons; the remaining $\frac{4}{5}$ (four-fifths) to be paid, $\frac{1}{5}$ (one-fifth) on production of each additional 200 tons.

Applications, addressed to the Minister of Agriculture, Adelaide, will be received up to and including the 31st day of December, 1902.

E. L. BATCHELOR, Minister of Agriculture.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report:—

September 1, 1900.

It is pleasing to report the splendid month's weather, showing a rainfall the heaviest for August during many years. The rains were widely distributed, so that crop prospects are better than at the beginning of September for a long time past. From south of the Burra and along the western side of the ranges, also on Yorke's Peninsula and the West Coast, everything gives good promise, although, unfortunately, accustomed as we are to uncertainties of our climate, we know it is as yet too early to risk prophesying concerning the probabilities of harvest. In the far north and north-eastern pastoral districts more rain is still required to face the summer, and it is to be hoped settlers there will obtain good stores of moisture during September.

The improvement in agricultural prospects is giving better tone to business circles, both in town and country; but trade generally can only be described as moderate. The mining industry makes steady progress, especially as the price of copper is keeping up, giving encouragement for the development of the lodes of this metal; and although no phenomenal discoveries are being made on the new goldfields at Tarcoola, the belief is daily growing that a payable field is being opened up.

In the grain trade a lifeless month has been experienced, values hardly fluctuating. The publication officially that the United States wheat yield this season would show 30 million bushels deficiency compared with the last failed to create any stir, speculators apparently seeing but small chance of a rise in price with such a heavy carry-over of this cereal from the previous crop. At the moment, however, London reports wheat firm, and locally millers are buying freely with quotations at a figure that with present rates of freight could not show a profit for export even if vessels were obtainable. This, in face of the possibilities of a bumper harvest, indicates at least that "the future is considered hopeful," which may be summed up as the present position in the world's breadstuffs trade. Forage lines are quiet, and, judging by local values of hay, farmers here seem to put more faith in the future of the fodder market than our Victorian neighbors do, who are supplying nearly all intercolonial trade. Feeding grains have been dull throughout the month; values remain unchanged.

No movement of any consequence has shown in potatoes beyond a slight advance which was expected and that ought to occur to pay holders for keeping samples thus late in the season. Supplies from Mount Gambier are not yet exhausted, although light importations are being made, chiefly from Tasmania. A sharp upward movement in the price of onions intercolonially was promptly reflected here, so that quotations now show a substantial advance upon rates of a month ago.

In the products of the dairy a heavy business for August was put through. Values in butter eased slightly at the beginning of the month, as a surplus began to show; this prompted the opening of export trade, so that shipment to Europe commenced, and the season promises to show a substantial increase in export over last year. Quality is not yet at its best, but as feed ripens we may expect in another month to see an improvement produced, both in quality and quantity, as the warmer weather approaches. That greater attention is being given to the poultry yard is shown by increasing supplies of eggs forward. The seasonable lowering in values has occurred, so that it may now be reckoned bottom has been about reached. In looking back at the average price for past twelve months it must be considered very satisfactory, whilst the firmly-established demand for our surplus, chiefly in the direction of Western Australia, gives every encouragement for the further development of this, not the least important of the minor farming industries. Buyers find it almost impossible to procure anything like matured samples of cheese, and, although factories are busily making, it will be some time yet before demand can be sufficiently overtaken to allow stocks to ripen enough to please consumers. Along with other live stock the value of pigs eased down, which quickly reacted upon the price of bacon, but any alteration in this line is now likely to be in an upward direction. Good business doing in honey, but at the moment the market is a shade weaker. Beeswax is active. Almonds continue very scarce.

Carcass Meat.—Though the trend in values of live stock was downward, a recovery in carcass pork occurred early in the month, and fairly maintained, heavy catalogues both of pork and veal being submitted at the weekly sales, meeting with good competition and selling at satisfactory results.

Live poultry also came forward in considerable quantities, but prices more than sustained, full rates being realised during the month, turkeys only fluctuating somewhat.

MARKET QUOTATIONS OF THE DAY.

Wheat.—New, at Port Adelaide, 2s. 10d. to 2s. 10½d. per bushel of 60lbs.

Flour.—City brands, £6 7s. 6d. to £6 12s. 6d.; country, £6 2s. 6d. to £6 5s. per ton of 2,000lbs.

Brn.—9d.; pollard, 10½d. per bushel of 20lbs.

Oats.—Local Algerian, 2s. 3d. to 2s. 6d.; prime Gambier milling, 3s.; ordinary stout feeding, 2s. 7d. to 2s. 10d. per bushel of 40lbs.

Barley.—Malting, 3s. 3d. to 3s. 9d.; Cape, 2s. per bushel of 60lbs.

Chaff.—£3 to £3 2s. 6d. per ton of 2,240lbs, dumped, f.o.b. Port Adelaide.

Potatoes.—Gambiers, £3 to £3 5s.; Tasmanian, prime redskins, £4 10s. to £5 per 2,240lbs.

Onions.—Gambier, £7 10s. to £8 per 2,240lbs.

Butter.—Creamery and factory prints, 9d. to 10d.; dairy and collectors', 7½d. to 8½d. per pound.

Cheese.—S.A. factory, choice matured, 8d. to 9d.; good new, 6½d. to 7½d. per pound.

Bacon.—Factory-cured sides, to 6½d.; nice farm lots, 5½d. to 6d. per pound.

Hams.—S.A. factory, 7d. to 8d. per pound.

Eggs.—Loose, 6½d.; in casks, f.o.b., 8½d. per dozen.

Lard.—In bladders, 5½d.; tins, 5d. per pound

Honey.—½d. for best extracted, in 60lb. tins; beeswax, 1s. 2d. per pound.

Almonds.—Soft shells, 5d. to 6d.; kernels, 1s. per pound.

Gum.—Best clear wattle, 2d. per pound.

Dressed poultry.—Turkeys, 6½d. to 7d. per pound; fowls and ducks, 5½d. to 6½d.

Carcass meat.—Handy sized shop porkers 4½d. to 5½d.; good baconers, 4d. to 4½d.; heavy and coarse, 3d. to 3½d.; good vealers, 1½d. to 2½d.; poor sorts, 1d. to 1½d.

Live poultry.—Prime roosters, 1s. 6d. to 2s. 5d.; light cockerels and fair hens, 1s. 1d. to 1s. 3d.; ducks, 1s. 9d. to 2s.; geese, 2s. 6d. to 3s. 6d.; pigeons, 6½d. to 8d.; turkeys, 4½d. to 6½d. per pound, live weight.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines.

Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese

SUGAR BEETS IN AMERICA.—According to the latest statistics, over 109,000 acres have been planted to sugar beets this year in America, against 37,000 acres last year. Owing to unfavorable conditions last year's area was 20,000 acres short of that sown in 1896. In California alone 49,000 acres will be under beets this year. In addition to heavy protective duties the industry also appears to require direct State assistance. In New York State 1 cent per pound is paid on sugar manufactured from beets grown in the state, and for which the farmers are paid £1 per ton. Minnesota pays 1 cent per pound bonus. Other states give similar assistance, it generally being made a condition that the factory pays not less than a certain price per ton for the beets. In some states the amount is fixed at a particular figure, irrespective of quality, while in others the minimum price varies according to sugar contents of the beet.

A LARGE BEET SUGAR FACTORY.—At Salinas, Mr. Claus Spreckles, of California, has erected the largest sugar beet factory in the world. It cost over £500,000, and will treat 3,000 tons of beets per day, producing 400 tons of raw sugar; 1,200 barrels of petroleum will be required daily for fuel, and 13,000,000galls. of water for treating the beets. The Alvarado Factory, Cal., is the oldest factory in the United States, having been in operation for thirty years, and can treat 800 tons of beets daily. The consumption of sugar in the United States averages about 2,000,000 tons annually, valued at about £25,000,000. Last year the local production of beet sugar amounted to nearly 122,000 tons, whereas in 1897 only 41,347 tons were produced in the States.

LENTIL SOUP.—Lentils (*Ervum lens*), when ground, form the bulk of the nourishing foods known as "revalenta" or "ervalanta." The "mess of pottage" for which Esau sold his birthright is said to have been made chiefly of lentils. They contain a good deal of pepsine, and are probably the most easily digestible food known. The following is one of many recipes for cooking lentils:—Wash and soak 1lb of lentils, removing all those that float on the top. Put them into two quarts of cold water, and boil for four hours; then rub through a sieve, diluting with milk or stock. Boil up again, season with pepper and salt, and just before serving stir in ½oz. of butter, cut into small bits, or a little cream; but be careful that the soup does not boil after this is added.

A RAINFALL COMPARISON.

In the following table the total rainfall for July and August of 1899 and 1900 is given. A glance through the table will show at once how much better the wheat plant, so far as the supply of moisture is concerned, is prepared for the warm weather than was the case last year.

Places.	July and August.		Places.	July and August.		Places.	July and August.	
	1899.	1900.		1899.	1900		1899.	1900.
	in.	in.		in.	in.		in.	in.
Adelaide	1.95	5.62	Balaklava ..	1.51	3.66	Strathalbyn ..	2.32	5.17
Hawker	0.66	1.66	Port Wakefield	0.85	3.11	Callington	1.79	3.09
Craddock	0.59	1.61	Saddleworth ..	1.62	6.34	Langhorne's		
Wilson	1.10	1.65	Marrabel	1.67	6.89	Bridge	1.77	3.55
Quorn	1.63	2.65	Riverton	1.39	6.25	Milang	2.22	4.00
Port Germein	0.74	1.74	Tarlee	1.22	4.12	Walleraro	1.12	2.61
Port Pirie	0.79	1.77	Stockport	1.53	4.92	Kadina	1.12	3.24
Crystal Brook	0.81	2.81	Hamley Bridge	1.22	4.15	Moonta	1.06	3.03
Pt Broughton	1.10	2.49	Kapunda ...	1.50	5.85	Green's Plains	1.28	3.17
Bute	1.38	4.19	Freeling	1.45	4.19	Maitland	1.73	5.75
Hammond ..	0.65	1.96	Stockwell	1.43	5.74	Aldrossan	0.98	3.99
Bruce	0.52	1.49	Nuriootpa	1.35	6.55	Port Victoria..	1.02	3.74
Wilmington ..	1.41	2.13	Angaston	1.48	5.88	Curramulka ..	2.14	4.97
Melrose	1.65	5.05	Tanunda	1.53	8.40	Minlaton	2.39	4.97
Booleroo Centre	0.72	2.77	Lyndoch	1.83	7.52	Stansbury	1.78	4.21
Wirrabara ..	0.47	4.95	Mallala	1.23	4.00	Warooka	1.34	4.30
Appila	0.77	2.75	Roseworthy ..	1.32	5.38	Yorketown	1.43	4.43
Laura	1.30	4.99	Gawler	1.41	5.59	Edithburgh ..	1.22	3.97
Caltowie	0.85	3.48	Smithfield ..	1.14	5.04	Fowler's Bay	2.77	4.02
Jamesstown ..	1.14	3.57	Two Wells ..	1.67	4.07	Streaky Bay ..	2.16	4.35
Gladstone	0.78	3.99	Virginia	1.55	4.98	Port Ellis on ..	2.00	5.00
Georgetown ..	1.04	4.03	Salisbury	1.43	4.57	Port Lincoln ..	2.83	6.84
Narridy	0.86	3.76	Teatree Gully	2.55	8.56	Cowell	2.17	2.23
Redhill	0.88	4.08	Magill	2.74	6.74	Queenscliffe ..	2.47	6.30
Koolunga	0.70	3.91	Mitcham	2.37	7.47	Port Elliot ..	2.55	5.80
Carrieton	0.94	2.76	Crafrers	4.56	14.98	Goolwa	2.00	3.67
Eurelia	1.33	3.40	Clarendon	3.89	14.73	Meningie	1.62	4.46
Black Rock ..	0.76	2.66	Morphett Vale	2.02	6.31	Kingston	2.81	8.06
Ororoo	0.76	2.99	Noarlunga	1.82	5.45	Robe	3.26	6.54
Johnburgh ..	0.98	2.79	Willunga	2.58	7.67	Beachport	5.68	7.75
Petersburg ..	0.76	2.10	Aldinga	2.36	6.57	Bordertown ..	1.05	4.91
Yongala	0.78	2.73	Normanville ..	2.27	4.98	Wolseley	0.91	3.93
Terowie	0.88	2.42	Yankalilla....	2.46	4.84	Frances	1.38	4.46
Yarcowie	0.93	2.90	Eudunda	1.68	4.93	Naracoorte ..	1.92	5.31
Hallett	1.69	4.06	Truro	1.14	5.89	Lucindale	1.85	5.92
Mount Bryan	1.65	4.15	Mt. Pleasant..	1.86	7.61	Penola	2.01	6.08
Burra	2.18	3.81	Blumberg	2.82	9.37	Millicent	3.97	8.88
Snowtown	1.03	5.41	Gumeracha ..	2.70	10.10	Mt. Gambier ..	4.04	8.02
Brinkworth ..	0.86	4.00	Lobethal	3.72	12.19	Wellington ..	1.15	2.91
Blyth	1.45	3.84	Woodside	3.60	9.94	Murray Bridge	1.66	2.75
Clare	2.55	8.28	Hahndorf	3.77	11.35	Mannum	1.41	1.73
Mintaro Central	1.68	7.75	Nairne	3.53	8.58	Morgan	0.68	1.04
Watervale	2.83	9.35	Mount Barker	4.08	9.66	Overland Cor-		
Auburn	1.86	7.58	Echunga	3.59	9.60	ner	0.58	1.61
Manoora	1.32	5.71	Macclesfield ..	4.39	9.59	Renmark	0.69	1.87
Hoyleton	1.75	5.06	Meadows	4.54	11.07			

MONTHLY RAINFALL.

The following table shows the rainfall for the month of August, 1900 :—

Adelaide	4.14	Hoyleton	4.06	Macclesfield	7.52
Hawker	1.09	Balaklava	2.79	Meadows	8.37
Craddock	0.92	Port Wakefield	2.21	Strathalbyn	4.22
Wilson	1.12	Saddleworth	5.11	Callington	2.64
Quorn	1.61	Marrabel	5.64	Langhorne's Bridge..	2.48
Port Germein	1.10	Riverton	5.13	Milang	2.89
Port Pirie	1.25	Tarlee	3.35	Wallaroo	2.00
Crystal Brook	1.39	Stockport	3.93	Kadina	2.33
Port Broughton	1.60	Hamley Bridge	3.37	Moonta	1.96
Bute	2.99	Kapunda	4.88	Green's Plains	2.38
Hammond	1.18	Freeling	3.58	Maitland	4.01
Bruce	0.94	Stockwell	4.45	Ardrossan	3.20
Wilmington	1.36	Nuriootpa	5.29	Port Victoria	2.82
Melrose	2.63	Angaston	4.85	Curramulka	3.89
Booleroo Centre	1.42	Tanunda	6.88	Minlaton	3.90
Wirrabara	3.04	Lyndoch	6.31	Stansbury	4.06
Appila	1.67	Mallala	3.12	Warooka	3.12
Laura	3.08	Roseworthy	4.40	Yorketown	3.33
Caltowie	1.91	Gawler	4.80	Edithburgh	3.14
Jamestown	2.36	Smithfield	4.28	Fowler's Bay	1.95
Gladstone	2.23	Two Wells	3.15	Streaky Bay	1.96
Georgetown	2.29	Virginia	4.06	Port Elliston	2.84
Narridy	2.43	Salisbury	3.67	Port Lincoln	4.51
Redhill	2.87	Teatree Gully	6.47	Cowell	1.04
Koolunga	2.75	Magill	4.81	Queenscliffe	4.19
Carrieton	1.61	Mitcham	5.31	Port Elliot	4.40
Eurelia	2.29	Crafers	11.75	Goolwa	2.82
Black Rock	1.52	Clarendon	12.27	Meningie	3.60
Orroroo	1.88	Morphett Vale	4.60	Kingston	6.13
Johnburgh	1.72	Noarlunga	3.88	Robe	4.56
Petersburg	1.39	Willunga	5.93	Beachport	5.47
Yongala	1.79	Aldinga	5.23	Bordertown	4.19
Terowie	1.61	Normanville	3.72	Wolseley	3.44
Yarcowie	1.88	Yankalilla	3.47	Frances	3.62
Hallett	2.51	Eudunda	3.93	Naracoorte	3.96
Mount Bryan	2.98	Truro	4.70	Lucindale	4.09
Burra	2.68	Mount Pleasant	6.42	Penola	4.43
Snowtown	4.21	Blumberg	7.64	Millicent	6.28
Brinkworth	2.68	Gumeracha	8.16	Mount Gambier	6.09
Blyth	2.70	Lobethal	10.51	Wellington	2.30
Clare	5.88	Woodside	8.50	Murray Bridge	2.23
Mintaro Central	6.28	Hahndorf	9.75	Mannum	1.45
Watervale	6.69	Nairne	6.94	Morgan	0.76
Auburn	6.26	Mount Barker	7.89	Overland Corner	0.98
Manoora	4.63	Echunga	7.70	Renmark	1.32

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY

(C. C. CORNISH, SECRETARY).

Labor Bureau.

Number of persons Registered, and found Employment by Government Departments and Private Employers, from July 26 to August 27, 1900.

Number Registered.			Number found Employment.
Trade or Calling.	Central Bureau.	Country Agencies.	
Laborers and youth laborers	111	179	352
Carpenters	19	7	18
Bricklayers and masons	2	2	16
Stonecutters	7	—	1
Ironworkers	2	—	3
Boilermakers and assistants	2	1	5
Blacksmiths and strikers	3	—	2
Fitters	3	2	2
Carriage trimmers	3	—	2
Painters	8	1	6
Plasterers	1	1	1
Carriage washers and junior porters.....	31	12	10
Glut porters.....	3	1	3
Cleaners ..	23	8	1
Apprentices	15	2	3
Rivet boys	2	—	2
General hand ..	—	—	1
Fencers.....	—	—	3
Totals	235	216	431

August 28, 1900.

A. RICHARDSON, Bureau Clerk.

General View of the English Factories Acts.

CONTRIBUTED BY INSPECTOR BANNIGAN.

(Continued from page 87.)

SANITARY PROVISIONS.

Under this head it will be convenient to treat factories and workshops separately, since the main part of the law which governs them is contained in different Acts and administered by different authorities. At the end of the article will be found certain miscellaneous sanitary provisions introduced by the Act of 1895, with regard to which workshops are on the same footing as factories.

A. Factories.

The sanitary conditions required fall under three heads—(a) cleanliness and freedom from effluvia; (b) overcrowding; (c) ventilation.

(a) Cleanliness, &c.—It is required generally that a factory shall be kept in a cleanly state, and that it shall be free from effluvia arising from any drain, watercloset, earthcloset, privy, urinal, or other nuisance. In particular all inside walls and ceilings or tops of rooms in a factory, and all passages and staircases, must either be painted with oil or varnished every seven years, and also washed with hot water and soap every fourteen months; or if they are not so painted or varnished and washed, they must be limewashed every fourteen months. The Secretary of State may exempt any class of factories from these special regulations as to painting and limewashing if they appear to him to be unnecessary or inapplicable.

(b) Overcrowding.—A minimum space is now required in each room of 250 cubic feet for each person employed, or during overtime of 400 cubic feet. The Secretary of State may modify this proportion for any period when artificial light (other than electric light) is used, and may require a larger space to be allowed in the case of any particular process or handicraft. A notice must be affixed showing the number of persons who may be employed in each room. If there is less space in any room than the minimum required, the factory is deemed to be so overcrowded as to be dangerous or injurious to the health of the persons employed there.

(c) Ventilation.—A factory must be so ventilated as to render harmless, so far as practicable, all the gases, vapour, dust, or other impurities generated in the course of the work that may be injurious to health. In a factory in which there is carried on grinding, glazing, or polishing on a wheel, or any process by which either dust, or any gas, vapour, or other impurity is generated and inhaled by the workers to an injurious extent, an inspector may require a fan or other mechanical means of ventilation to be provided, maintained, and used if he thinks that the inhalation can be largely prevented by such means.

The authority charged with the duty of seeing that the above-mentioned rules are carried out in a factory is the factory inspector for the district. His position, powers, and duties will be explained later on.

B.—Workshops.

As far as sanitary provisions are concerned, the Act of 1891 excluded workshops from the operations of the Factory Acts, and brought them under the Public Health Acts. The regulations and requirements of the Public Health Acts on this subject, as supplemented by section 40 of the Act of 1891, are nearly the same as those of the Factory Acts relating to the sanitary condition of factories, which are set out above under the three heads of cleanliness and freedom from effluvia, overcrowding, and ventilation. The only difference in the case of workshops is that mechanical means of ventilation are never required in a workshop, and that the special regulations as to painting and lime-washing, which are set out above under the head of "Cleanliness," do not extend to workshops. It is provided instead that the sanitary authority may give notice to the owner or occupier of a workshop, requiring him to lime-wash, cleanse, or purify the workshop, or part of it, if this appears necessary for the health of the workers. If the owner or occupier makes default he is liable to a fine of 10s. per day, and the sanitary authority may do the necessary work at his expense.

The chief importance of the alteration effected by the Act of 1891 in bringing workshops under the Public Health Acts lies in the means by which the law is enforced. The controlling authority for workshops now is the sanitary

authority, acting by their officers, the medical officer of health, and the inspector of nuisances, who have for this purpose the powers of factory inspectors. A breach of the law on this subject is declared to be a nuisance, and may be dealt with summarily under the Public Health Acts.

There are, however, two cases in which, if the sanitary authority are in default in executing the law relating to workshops, the factory inspector may take action. First, if the Secretary of State is satisfied that the provisions of the Public Health Acts as to the sanitary condition of any workshop or class of workshops or laundries are not observed, he may by order authorise factory inspectors to take the necessary steps for enforcing those provisions. In this case factory inspectors have the same powers as under the Factory Acts; they may take any proceedings that may be taken by a sanitary authority, and they may recover their expenses from the sanitary authority in default.

Secondly, in case of any act, neglect, or default in relation to any drain, watercloset, earthcloset, privy, ashpit, water supply, nuisance, or other matter in a factory or workshop, which can be dealt with under the Public Health Acts but not under the Factory Acts, the factory inspector may give notice to the sanitary authority, and in case the sanitary authority fail to take proceedings within a month to enforce the law, the inspector can take any proceedings which might be taken by the sanitary authority, and may recover the expenses from the sanitary authority. The sanitary authority are required to inform the inspector of any proceedings taken by them in consequence of the inspector's notice.

It will be observed that the second of the above cases relates to factories as well as workshops, and would apply to a defect of a structural nature in a factory, such as would not ordinarily come within the scope of an inspector's powers.

In addition to the general sanitary provisions already mentioned, with regard to which factories and workshops are subject to the different authorities, the Act of 1895 has introduced some new sanitary requirements. These are as follows:—

1. Adequate measures must be taken for securing and maintaining a reasonable temperature in each room in which any person is employed.

2. A limit is set to the amount of atmospheric humidity permitted in textile factories in which such humidity is artificially produced, and which are not subject to special rules, by the application to such factories of the Cotton Cloth Factories Act, 1889, with such modifications in the scale of maximum limits as the Secretary of State may direct.

3. There must be a sufficient and suitable supply of sanitary conveniences, and where persons of each sex are employed there must be separate accommodation for each sex.

A similar obligation to supply sanitary conveniences is also imposed by section 22 of the Public Health Acts Amendment Act, 1890, in places where the section is in force, that is to say, in boroughs and urban districts in England and Wales, where the borough or district council have adopted the part of the Act containing that section. In such boroughs and urban districts the enforcement of the obligation is in the hands of the sanitary authority, and the factory inspector has no powers or duties in the matter. Elsewhere in England and Wales, and in the whole of Scotland and Ireland, it is the duty of the factory inspector to require the supply of sufficient and suitable sanitary conveniences. In London the factory inspector and the sanitary authority have concurrent powers and duties in the matter.

It will be observed that the person responsible, under the provisions enumerated in this article, for the sanitary condition of a factory or workshop, except in tenement factories, where under 1895, section 24, the owner is substituted for the occupier.

Dunedin Saddlers.

In the matter of the "The Industrial Conciliation and Arbitration Act, 1894," and in the matter of a recent dispute between the Otago Saddlers', Harness, and Collar Makers' Union and certain master saddlers, the Conciliation Board for the industrial district of Otago and Southland, having received the necessary proofs establishing its jurisdiction in the matter, and having heard the parties and considered the evidence, recommended as follows:—

That the parties to the said dispute enter into an industrial agreement for two years from the first day of July, 1900, to contain the following provisions—

1. *Conditional Operation.*—The agreement shall not come into force unless three-fourths of the employers in the district sign it, unless those who have not signed be brought in by the Court of Arbitration.

2. *Conditions of Labor.*—The recognised hours of work shall be from 8 a.m. to 5:30 p.m. on five days of the week, and from 8 a.m. to 1 p.m. on Saturday; one hour to be allowed each day for dinner (Saturdays excepted).

3. All journeymen working at any branch of the trade (except as hereinafter mentioned) shall be paid not less than two pounds eight shillings (£2 8s.) per week.

4. Any journeyman who considers himself not capable of earning the minimum wage may be paid such less wage as may from time to time be agreed upon in writing between such journeyman and the president and secretary of the Otago Saddlers' and Collarmakers' Union and the president and secretary of the Otago and Southland Master Saddlers' Association.

5. All time worked beyond the time mentioned in clause 1, or on holidays, shall be considered overtime, and shall be paid for at the rate of time and a quarter for the first four hours and time and a half afterwards, on any day except Good Friday, Christmas Day, and Sunday, which shall be paid for at the rate of double time.

6. *Holidays to be Observed.*—First and second January, Anniversary Day, Good Friday, Easter Monday, birthday of reigning Sovereign, Labor Day, Christmas Day, and Boxing Day.

7. Employers shall employ members of the Otago Saddlers', Harness, and Collarmakers' Union in preference to non-members.

8. The proportion of apprentices to journeymen employed by any employer shall not exceed one apprentice to every three journeymen or fraction of three.

9. Men are to give and receive a week's notice of leaving the service or of dismissal, unless dismissed for cause.

10. The term of apprenticeship to be for five years, and that the following wages be paid to apprentices—First year, 5s. per week; second year, 10s. per week; third year 15s. per week; fourth year, 20s. per week; fifth year, 25s. per week.

Several of the employers having refused to sign the agreement, the above recommendation was not signed, and it was decided by the board "that the matter be referred direct to the Court."

The Court made the following award:

The Court of Arbitration of New Zealand, having taken into consideration the matter of the above-mentioned dispute, and having heard the union by its representatives duly appointed, and having also heard such of the employers as appeared before it, the other employers not appearing either personally or by representative, doth hereby order and award as follows:—

1. The hours of work shall be forty-eight in each week. On Saturday in each week the hours of work shall expire not later than 1 p.m. All work worked beyond the time mentioned in this clause, or on holidays, shall be con-

sidered overtime, and shall be paid for at the rate of time and a quarter for the first four hours; time and a half after 10 p.m.; double time after midnight, on any day except the days mentioned in paragraph 14 hereof, on which days all work shall be paid for at the rate of time and a half.

2. Only three classes of workers shall be recognised or employed, namely:— journeymen (which shall include journeymen and journeywomen), apprentices, and female stitchers.

3. Every journeyman, except those working at piecework, working at any branch of the trade (except as hereinafter mentioned) shall be paid not less than 1s. per hour.

4. Any journeyman who considers himself not capable of earning the minimum wage may be paid such less wage as may from time to time be agreed upon in writing between any employer and the president and secretary of the union; and in default of such agreement within twenty-four hours after such journeyman has applied in writing to the secretary of the union stating his desire that such wage shall be agreed upon, as shall be fixed in writing by the Chairman of the Conciliation Board for the industrial district upon the application of such journeymen after twenty-four hours' notice in writing to the secretary of the union, who shall (if desired by him) be heard by such chairman on such application. Any journeyman whose wage has been so fixed may work and may be employed by any employer for such less wage for the period of six calendar months thereafter, and after the expiration of the said period of six calendar months, until fourteen days' notice in writing shall have been given to him by the secretary of the union requiring his wage to be again fixed in manner prescribed by this clause.

5. All boys working in any branch of the trade shall be legally indentured as apprentices for the term of five years, but every boy so employed may be allowed two calendar months' probation prior to being so indentured, such period—if such boy be indentured at the end of such period—to be counted as part of the said period of five years. Apprentices who, on the 16th day of March, 1900, were serving an apprenticeship without indentures may complete such apprenticeship without being indentured, but it shall be incumbent upon the employers with whom such apprentices were so serving to give notice in writing to the secretary of the union, within one calendar month from the date of this award, of the name of each such apprentice, and of the period when his service began, and when it is to end: Provided that the total period of such service as an apprentice shall not exceed the period of five years.

6. The proportion of apprentices and female stitchers to journeymen employed by any employer shall not exceed the following, viz.:— In the saddlery branch, one apprentice and one female stitcher to every three journeymen, or fraction of three journeymen; in the harness branch, two apprentices to every three journeymen; in the bridle-cutting branch, one apprentice to one journeyman; in the collar-making branch, two apprentices to every three journeymen. In any business in which the several branches of the trade shall be combined, the proportion of apprentices and female stitchers to journeymen shall not exceed two apprentices or female stitchers, or one apprentice and one female stitcher, to every three or fraction of three journeymen. Except where otherwise directed, female stitchers may be employed by an employer though not apprenticed, as such employer may desire, but the court reserves to itself the power to make any such award at any time before the expiration of this award as it may consider necessary for the employment or terms of employment of female stitchers.

7. For the purpose of determining the proportion of apprentices to journeymen, in taking any new apprentice the calculation shall be based on a two-thirds full-time employment of the journeymen employed during the previous three calendar months.

8. Arrangements between employers and apprentices existing at the time of the hearing of this dispute in this court shall not be prejudiced.

9. If any employer shall, from any unforeseen cause, be unable to fulfil his obligation to an apprentice, it shall be lawful for such apprentice to complete his term with another employer, notwithstanding that such employer has already the full number of apprentices allowed by these conditions.

10. The wages to be paid to apprentices shall be as follows:—For the first year, 5s. per week; for the second year, 8s. 6d. per week; for the third year, 11s. per week; for the fourth year, 15s. per week; for the fifth year, £1 per week.

11. If, and so long as the rules of the union permit, any person now employed in the trade in this industrial district, and any person who may hereafter reside in this industrial district, and who is a competent journeyman, to become a member of such union upon payment of an entrance fee not exceeding 5s., and of subsequent contribution (whether payable weekly or not) not exceeding 6d. per week, upon a written application of the person so desiring to join such union, without ballot or other election, and shall give notice in writing thereof to the employers, then, and in such case employers shall employ members of the union in preference to non-members, provided that there are members of the union equally qualified with non-members to perform the particular work required to be done, and ready and willing to undertake it: Provided always that the foregoing provisions of this paragraph shall not apply in any cases where an employer shall apply to the officer in charge of the Labor Bureau of Dunedin between the hours of 9 a.m. and 12 noon on any day to send to the chief place of business of such employer in Dunedin or its suburbs, at a date and hour to be named by such employer, a member of the union, and no member of the union able and ready and willing to undertake the work required to be done shall attend at such place of business at the hour named by such employer, such hour not being earlier than 1 p.m. on the day such application is made.

12. If, and when the rules of the union do not comply with the provisions of the last preceding paragraph hereof, employers may employ journeymen whether members of the union or not, but no employer shall discriminate against members of the union, and no employer shall in the employment and dismissal of journeymen, or in the conduct of his business, do anything for the purpose of injuring the union, whether directly or indirectly.

13. When members of the union and non-members are employed together, there shall be no discrimination between members and non-members, and both shall work together in harmony, and shall receive equal pay for equal work.

14. The following days shall be recognised holidays in all Branches:—New Year's Day, Good Friday, Easter Monday, the birthday of the reigning Sovereign, Labor Day, Christmas Day, Boxing Day, and the 2nd of January.

15. And the Court doth hereby further order and award that, as between the union and members thereof and the employers and each and every one of them, the terms, conditions, and provisions herein contained shall be binding upon the union and the members thereof, and upon the employers and each of them; and, further, that the union and every member thereof, and the employers and each of them, shall respectively do, observe, and perform every act, matter, and thing by the terms, conditions, and provisions of this award on the part of the union and the members thereof, and also on the part of the employers and of each of them respectively required to be done, observed, and performed, and shall not do anything in contravention of the said terms, conditions, and provisions, but shall in all respects abide by and observe and perform the same.

16. And this Court doth hereby further award, order, and declare that any breach of the said terms, conditions, and provisions shall constitute a breach of this award, and that the sum of £100 shall be the maximum penalty payable by any party or person in respect of any such breach: Provided, however (as provided by the third section of "The Industrial Conciliation and Arbitration Act Amendment Act, 1898"), that the aggregate amount of penalties payable under or in respect of this award shall not exceed the sum of £500.

17. And this Court doth further order that this award shall take effect from the 29th day of June, 1900, and continue in force until the 1st day of June, 1902.—*Journal of the Department of Labor, New Zealand*



Journal of Agriculture

AND

Industry.

No. 3. REGISTERED AS

OCTOBER, 1900.

[A NEWSPAPER. VOL. IV.]

NOTES AND COMMENTS.

The weather during the past month has been distinctly favorable, and the prospects for the harvest are very good, with the exception, however, of some of the outside districts of the North-East and Far North, where the rainfall has throughout the season been scanty. September has been marked by the frequent soaking showers experienced, and by the absence of the hot drying winds that have done so much damage in previous years. A good harvest is now confidently looked for. Feed generally is plentiful, and supplies of dairy produce are increasing. The fruit trees generally will, as a result of the wet season, be in better condition than during the past few years, though fungoid diseases will probably be present to a considerable extent owing to the same favorable conditions.

It has been contradicted that the straw of wheat that has been reaped whilst the grain is in the advanced dough stage is within 15 per cent. of the nutritive value of the best wheaten hay; that the grain is brighter, heavier, and contains more gluten and less bran than grain left until dead ripe before it is harvested; and that the grain continues to fill up when the sheaves are stooked. Good authorities have made the foregoing statements that are now contradicted, and it remains for every farmer to test the matter thoroughly for himself, because the issues are of the greatest importance. Every one admits that straw loses value for each day it is left standing in the field, and naturally the earlier it is harvested the greater its value.

Some members at the Congress of the Agricultural Bureau were desirous to have a definition of "mongrel." The word means "an animal of mixed breed," otherwise "a cross-bred animal." But the most commonly accepted interpretation is "the progeny from cross-bred animals on both sides." There is one distinction between mongrel and pure-bred sires which seems to be lost sight of when this matter is discussed. It can be admitted that occasionally a mongrel may beget really good stock; but, as a general rule, the progeny is no better—and often worse—than himself. The pure-bred animal almost invariably begets superior progeny, even from an inferior dam.

"Fishiness" in butter is unknown in Denmark, but is extremely prevalent in Australian butter exported to London. Dr. Burck, an eminent Danish authority, has no doubt that fishiness is due to the milk not being cooled directly after it is taken from the cow. "Animal odor" or "cowiness" in milk has long since been found to be due to neglect of rapid cooling of the milk directly after it is taken from the cow. The Lawrence milk-cooler or some other contrivance will probably have to be generally adopted ere Australia secures the highest reputation for butter.

Some people, more regardless of other men's rights than of their own convenience, make a great to-do about being compelled to spray, bandage, or fumigate a few trees in their back yards or small gardens, with a view to destroy fruit pests, and prevent them spreading to other gardens whose owners depend for a living upon the produce. What would they say if the drastic proceedings adopted in San Francisco were put into force here? The Horticultural Commissioners go from property to property, serving notices upon every person owning a tree or trees infected with any insect pest, ordering such to be fumigated at once. If the order is not attended to, the trees are fumigated at the cost of the owner, by the employes of the commission. As a result hundreds of really valueless fruit trees are cut down by the owners rather than fumigate them.

A lady from Upington informs the *Natal Agricultural Journal* that she has kept oranges in perfect condition for a year by packing them in layers alternately with dry earth. A layer of dry earth is laid in a box, then a single layer of oranges; another layer of earth, and finishing with dry earth on top; then close the box. Dry earth only must be used.

Fruitgrowers should try a 3 per cent. carbolic acid spray on their apple and pear trees directly after the petals have fallen from the flowers, and should also try resin wash on some others at the same time, with the object of protecting the fruit against the larvæ (or caterpillars) of the codlin moth. It is generally supposed that the female moth is guided, when depositing her eggs, by the aroma or odor of the newly forming fruit, but when this is disguised by the "perfume" of carbolic acid she fails to locate the pabulum for her future progeny. Should she, however, succeed in depositing her ovæ in a suitable position, the abominable flavor of the resin wash would be so nauseous that that they would die of starvation rather eat the fruit.

Consul Conert, of Lyons, France, reports that apples in France this season promise to be wonderfully plentiful—so abundant that prices will probably be ruinously low. Other fruits also promise to be equally plentiful. This news will affect American growers far more seriously than Australian, because our fruit comes in after the European markets are depleted, and before the strawberries and early fruits come in.

The berry crops in the United States of America are very short this season, consequently there will not be much done in the canning business, and this will prevent export to some extent.

The currant crop of Greece, including the Ionian Islands, has been practically reduced to about one-third of the average through the prevalence of a parasitic fungus disease. This will not be regarded as bad news by Renmark and Mildura raisin and currant growers, but the very marked increase in local prices which has already taken place makes the consumer look upon the matter in a different light.

In respect to technical and practical teaching in country schools in Belgium and Holland, Mulhall (statistician) says:—"The farmer is taught agriculture and husbandry in the schools, upon both advanced and economic lines. He is taught to keep accounts, to show the cost of production—that is to say, what it would cost to produce a pound of cheese, butter, or pork, or a bushel of corn. The girls receive practical demonstrations in cooking and housekeeping, and not only in connection with food, but clothing and all other household expenditure are dealt with to instruct the girls in the best methods of home economy. The copybooks are really manuals of household thrift. These institutions are known as *Ecoles Manageres*, and those in the country rural districts are specially adapted for farmers' sons and daughters."

There would be far more practical utility, in regard to farmers' sons and daughters, in the knowledge of agronomical practices and household management than in acquaintance with some of the items which are taught in our schools.

The President of the Queensland Acclimatisation Society, in an address at the Agricultural Conference lately held at Warwick, Queensland, said it would probably stagger Australasia if the money value of the damages inflicted upon settlers in the Australasian, New Zealand, and Tasmanian colonies through introduced pests could be ascertained. Now, these include rabbits and numerous quadrupeds, sparrows and many other birds, oxalis species and multitudinous weeds, codlin moths, and no end of noxious insects, pear, apple, and other "scabs," with innumerable other microscopic parasitic fungi, sheep scab, tuberculosis, bots, bubonic plague, smallpox, and a lot of other diseases affecting man and the lower animals. Mr. L. G. Corrie dealt in detail with a choice and limited selection from the above, but it would require a very large ledger to contain all the items of cost against our imported pests, to say nothing of those indigenous to the various colonies.

The only reasons for "making" manure on farms and for gardens are want of time to spread it at once on the ground, the "burning" effect of raw manure on some crops, and the certainty of introduction of weeds with the new manure. The objections to "making" are the labor and cost, the great loss in bulk and weight, and the large diminution of the nitrogenous contents owing to fermentation, oxidation, and escape in the form of ammonia. If the manure could be carried out and spread at once there would be very little fermentation and loss, but the soluble salts would be carried into the soil with the first light rains. If the manure could be at once covered with soil the fermentation would ensue, and the whole of the results would be fixed and retained in the soil.

At the Dominion Experimental Farms, Canada, exhaustive experiments have been conducted to test the value of various green crops ploughed under to serve as fertilisers. By far the most satisfactory results have been obtained from clover, 10lbs. of which was sown along with the grain. After the various cereals had been harvested the clover grew vigorously, and when in flower it was ploughed under. Plots were also sown separately, but results were the same as where sown with cereals. Banner oats gave an increase, the year after the clover was ploughed under, of 28 per cent. in grain and 78 per cent. in straw over crops sown where no clover had been turned under. Next year the same fields were sown with Menshury barley, with a gain of 29 per cent. in grain and 35 per cent. in straw. The director strongly urges farmers to feed off the clover before ploughing, as this is far more profitable.

Where is the advantage of a buckjumping horse? And yet there have been prizes offered by so-called "agricultural" societies for the best exhibits of buckjumping. Of course there is excitement for the crowd, and an attraction of this sort brings in a mob and increases the gate money; but buckjumping horses are not desirable in any other sense. The aim of every agricultural society should be improvement in everything pertaining to rural industries, and not to secure gate money by aid of vulgar and useless—if not positively harmful—exhibitions of any kind.

It is all very proper to give prizes for the largest collections of heads and eggs of sparrows, starlings, and other pestiferous birds at our shows; but to give prizes for miscellaneous birds eggs, including those that are useful, is almost a criminal act. Such prizes, however, have been offered by some of the societies in the horticultural districts even.

Snails and slugs are becoming exceedingly abundant in all gardens near to Adelaide. In the Botanic Garden the children of the resident gardeners are encouraged by a bonus of 6d. per gall. to collect the snails, and by their efforts the pest is kept down to a considerable extent; but in some other gardens it would be possible to gather snails by the bushel. There is a probability that a strong extract of tobacco sprayed on plants will destroy the slugs and snails. Experiments that have been made on a small scale have proved to be efficacious in that direction, and it is now recommended that all persons who are troubled with the slimy molluscs in their gardens should try the supposed remedy.

Caterpillars are unusually numerous this season in many localities. Many species of these can be destroyed wholesale with baits made as follows:—Dissolve 8ozs. of common arsenic with 16ozs. of ordinary washing soda in 3galls. of boiling water; stir in 3lbs. of cheap sugar or molasses, and then mix it with 30lbs. bran and 5lbs. pollard till it forms a paste that can be rolled into balls about the size of a marble. Drop these pellets where the caterpillars can get at them, and they will travel from around, eat the bait, and all trouble is ended. It is very probable that the same bait would be attractive to the young locusts that are now hatching. Vines and trees could most probably be protected against ravages by locusts if they were well sprayed with resin wash.

AGRICULTURAL BUREAU CONGRESS.

The Twelfth Annual Congress of the Agricultural Bureau was held in the exchange room, Town Hall, Adelaide, on Tuesday, Wednesday, and Thursday, September 11, 12, and 13 respectively. Mr. F. E. H. W. Krichauff, Chairman of the Central Agricultural Bureau, presided over the meetings.

The following members of the Bureau attended one or more sessions :—
 Central Bureau : Messrs. F. E. H. W. Krichauff (Chairman), H. Kelly, W. C. Grasby, M. Holtze, J. Miller, Thomas Hardy, and A. Molineux (Secretary).
 Albert : Messrs. J. Wetherall and F. Drogemuller. Amyton : Messrs. Jno. Gray, W. Hawke, J. Gum, and J. Kelly. Angaston : Messrs. R. Player and S. O. Smith. Appila-Yarrowie : Messrs. P. Lawson, J. Wilsdon, E. Catford, W. Stacey, W. C. Francis, and A. Fox. Arden Vale : Messrs. C. Pearce, J. M. Searle, and E. H. Warren. Arthurton : Messrs. J. B. Rowe and W. H. Hawke. Bakara : Messrs. H. R. Hayward and F. C. H. Martens. Baroota Whim—Messrs. F. W. Flugge and C. W. Hoskin. Booleroo Centre : Mr. W. Michael. Bowhill : Messrs. W. Towill, J. McGlashan, and J. Gregory. Brinkworth : Messrs. A. L. McEwin and G. Freebairn. Burra : Messrs. F. A. S. Field and Jas. Scott. Bute : Messrs. W. H. Sharman and E. Ebsary. Caltowie : Messrs. J. Lehmann, A. McDonald, and A. McCallum. Carrieton : Messrs. J. B. Harrington, N. Travers, and J. W. Bock. Cherry Gardens : Messrs. J. Potter, R. Gibbins, and C. Ricks. Clare : Messrs. W. Kelly and W. Kimber. Clarendon : Messrs. A. L. Morphett, W. Henty, J. Piggott, J. Wright, A. Harper, and W. A. Morphett. Colton : Mr. R. Hull. Cradock : Messrs. R. Ruddock and W. Symons. Crystal Brook : Messrs. W. J. Venning and J. C. Symons. Davenport : Messrs. W. G. Pryor and J. Roberts. Dawson : Mr. P. J. Byrne. Finniss : Messrs. W. W. Heath, F. Dreyer, and H. Wallenstein. Forster : Messrs. F. Towill and J. D. Prosser. Gawler River : Messrs. H. Roediger and A. Bray. Gladstone : Messrs. W. A. Wornum and C. Goode. Gumeracha : Messrs. W. Green, A. Moore, W. A. Lee, and W. V. Bond. Hahndorf : Mr. D. J. Byard. Hawker : Messrs. J. Smith, A. C. Hirsch, and F. C. Hirsch. Inkerman : Messrs. W. Fraser and W. Board. Johnsbury : Messrs. T. Thomas and L. Chalmers. Kadina : Messrs. D. F. Kennedy and T. M. Rendell. Kanmantoo : Mr. F. Lehmann. Kapunda : Messrs. G. Teagle, G. Harris, and W. Flavel. Koolunga : Messrs. E. J. Shipway, J. Button, T. B. Butcher, J. Sandow, R. Lawry, and W. Jose. Maitland : Messrs. J. Hill and A. Jarrett. Mallala : Messrs. G. Marshmann, H. Moody, R. Butler, and A. Moody. Mannum : Messrs. H. Brown and J. G. Preiss. Meadows : Mr. W. J. Stone. Meningie : Messrs. W. Tiller and S. F. Robinson. Millicent : Messrs. E. J. Harris and A. McKostie. Minlaton : Messrs. W. Correll and Jos. Correll. Morgan : Messrs. J. Wishart, R. Wohling, and C. Pfizner. Mount Bryan East : Messrs. W. Dare and Thos. Wilks. Mount Gambier : Messrs. J. C. Ruwoldt, E. Lewis, and J. Watson. Mount Pleasant : Mr. G. Phillis. Mount Remarkable : Messrs. C. E. Jorgensen and W. Lange. Mundoorra : Mr. R. Harris. Murray Bridge : Messrs. J. G. Jaensch and W. Lehmann. Mylor : Messrs. W. G. Clough and H. R. Antuar. Nantawarra : Messrs. J. W. Dall, T. Dixon, C. Belling, and A. L. Greenshields. Naracoorte : Messrs. J. Wynes, S. Schinckel, E. C. Bates, and J. D. Smith. Narridy : Mr. Thomas Dunsford. Norton's Summit : Mr. A. Smith. Onetree Hill : Messrs. F. L. Ifould, J. Clucas, and J. Bowman. Orroroo : Messrs. J. Moody, W. L. Lillecrapp, Jas. Jamieson, and G. Matthews. Paskeville : Messrs. W. S. O'Grady, H. F. Koch, and A. Palm. Penola : Messrs. T. H. Morris and H. Ricketts. Petersburg : Messrs. F. W. Sambell, W. Miller, and S. Bottrall.

Pine Forest : Messrs. F. Masters, W. H. Jettner, G. Inkster, and A. Inkster. Port Broughton : Messrs. W. R. Whittaker, H. H. Whittle, and G. Patingdale. Port Elliot : Mr. J. Brown. Port Germein : Messrs. G. Stone and E. J. Blesing. Port Lincoln : Mr. John Anderson. Port Pirie : Messrs. W. Smith, P. J. Spain, and F. R. Humphris. Pyap : Messrs. A. J. Brocklehurst and B. T. H. Cox. Quorn : Messrs. A. F. Noll and C. Patten. Redhill : Messrs. S. H. Treloar and A. E. Ladyman. Renmark : Mr. R. Kelly. Richman's Creek : Messrs. J. McColl, W. Freebairn, and J. J. Searle. Riverton : Messrs. J. Kelly, H. A. Davis, and M. Badman. Robertstown : Messrs. H. Farley and J. E. Milde. Stansbury : Messrs. P. Anderson, P. Cornish, and J. Sherriff. Stockport : Messrs. D. G. Stribling and J. F. Godfree. Strathalbyn : Messrs. Geo. Sissons, M. Rankine, and Wm. Rankine. Swan Reach : Messrs. J. L. Baker and W. Hecker. Tanunda : Messrs. E. Trimmer and A. B. Robin. Tatiara : Messrs. W. E. Fisher, H. Killmier, T. Stanton, and A. D. Handyside. Wandearah : Messrs. G. Robertson and C. E. Birks. Watervale : Messrs. J. Thomas and E. W. Castine. Willunga : Messrs. W. J. Blacker and W. J. Binney. Wilmington : Messrs. A. Maslin and R. Cole. Woodside : Messrs. F. W. Drogemuller and R. W. Kleinschmidt. Woolundunga : Messrs. N. Rogers, N. J. S. Rogers, J. G. Moseley, H. Aldenhoven, J. Greig, and J. Grunke. Wilson : Messrs. W. H. Neale, A. Canning, and D. McNeil. Yankalilla : Mr. G. H. MacMillan. Yorketown : Mr. J. Davey.

Opening Ceremony.

THE CHAIRMAN said : I desire to make a few preliminary remarks. I ask you first of all to be punctual. There will be no votes of thanks for any special paper. Of course the address by the Minister is a matter by itself. At the end of the meetings somebody will propose a general vote of thanks. I will now introduce the Minister of Agriculture and Education, and I hope that he will forward the agricultural interests to the best of his ability.

THE MINISTER OF EDUCATION AND AGRICULTURE (Hon. E. L. Batchelor), received with cheers, said : I am very glad that I am able to be present this afternoon. I would have been extremely disappointed if anything had kept me from attending the meeting, because I consider it one of the chief functions of the Minister of Agriculture to attend at the opening of the Annual Congress of the Agricultural Bureaus, and I hope and believe that the result of this Congress will be the same as that of others—of great benefit to the agricultural interests throughout the colony. I am not going to give any prepared and elaborate address, but I will content myself with touching on one or two points. First of all, one cannot speak to any gathering of agriculturists—indeed to scarcely any gathering—at the present time without some reference to the weather and crops, and fortunately the season this year is on the whole a matter for congratulations all round. Of course it is a mistake to count your chickens before they are hatched. Sometimes we have indulged in congratulations on the hopeful prospects at this time in September, and when the harvest came to be reaped quite another tale was told. But a good season seems to be already assured, and I am sure people throughout the whole colony who have no direct connection with agriculture are rejoicing at the prospects of this year. Last year the season was somewhat disappointing, and the result was doubly unfortunate. The farmers did not reap as much as they expected to do, and, further, there was an opportunity during last year of exploiting a market that does not often happen. I refer to the market in South Africa. There was a great opportunity, if we had had the produce, of doing a good thing with the South African market, but we were short, and unable to supply them with a great deal of produce. Most of the produce from Australia was supplied by Victoria. The only thing in which we exceeded the other colonies and had a practical monopoly was in jam.

South Australia took the leading place in the supply of jam. With reference to this question of finding new markets, and taking advantage of any new markets that may possibly be seized upon, it is very necessary that we should have the greatest facilities at the chief ports, and especially at Port Adelaide. I am not going to discuss the question of a graving dock or the opening of the Port river, but I would just like to point out the bearing which having specially good facilities, equal to the first-class ports of other countries, has on trade. Without the best facilities ships are prevented from coming up alongside the wharves. This causes the necessity for lighterage, which adds to the cost of the goods and tells against the producer. One of the things that the Government and Parliament has to see to is that every facility is given for the encouragement of produce and the export of produce. This year the dairying industry will at any rate be at a somewhat greater advantage than hitherto. It has been felt that the means of conveyance between the depôt and the ships has been very much against the South Australian butter. I felt quite certain from inquiries I made that the reports which sometimes appear in the papers as to the heat the butter acquires in transit from the depôt to the ship has been very much exaggerated, but, notwithstanding that, there is no doubt that to carry it in ordinary lighters is greatly to the disadvantage of the trade. That will not be so in the future. We have arranged with the Tug Company, and in this matter we have adopted the policy of the State working in conjunction with private enterprise. Private enterprise will provide the lighters and the insulating, and the State will provide from the depôt the refrigerant, and by this mutual co-operation the producers will get the benefit because there is no increase of charges, and there will be no possible danger in the future from damage to produce. In addition, during the past year we have provided more cool cars. Another matter which the Dairy Board is very strongly concerned about is the necessity for having a well lighted, well ventilated place, free from noxious smells, for the examination of butter. We have provided ideal requirements in these respects. So they will have very little cause for complaint so far as matters brought under the notice of the department in connection with the dairy industry are concerned. We are going in for very extensive tests by the Dairy Instructor, to see if we can find out the cause of fishiness, and how to provide a remedy. The producers I see in front of me are all more or less concerned in the butter industry, and I hope you will back up the department in this matter, particularly in trying to get a first-rate quality and a first class reputation for South Australian produce. This is a very important matter, and I wish to draw your attention to it. The Government are doing fairly well. We have provided for almost everything asked for, and we ask the producers, on the other hand, to back up the department, and to see that the grading is thorough, and that nothing misleading is shipped to London. If produce bears the South Australian brand it should be a guarantee that it is good. That is what the department has been trying to bring about. That is what will pay in the long run. There is always plenty of room on top, and there are always better prices for a first-class quality article; and as it is a big thing for any one firm to build up a reputation, so it is a big thing for any one colony to do likewise. The reputation of the Canterbury lambs is a splendid thing for the sheep graziers in New Zealand. So with South Australian lambs we want to build up a reputation. We are going, if possible, at the Produce Depôt to reject alive all lambs not up to requirement. That will give producers who send lambs in which are not up to the standard a better chance of getting rid of them at a fair rate than has been the case in the past. I would like to say what a splendid thing it is for South Australian apple growers that South Australia has the reputation for providing not only the best apples, but apples packed better than any other colony packs them. That has been the means of giving the growers a much better price. South

Australian apples now fetch the best prices. I was in hopes of inviting you all down to see the new works at Port Adelaide and Dry Creek in full swing, but owing to circumstances over which the department had no control, that will be impossible. First of all, the lambs are not yet forthcoming in any quantity, and the works are not sufficiently advanced to see them in their completed state. While on that subject I would like to say a word or two on the matter as to whether the export trade is being conducted to the best advantage. I refer to the additions and alterations made in connection with the Produce Dépôt, and the separation from Port Adelaide of the slaughtering works. It is well known in connection with any business that the more it is kept together the cheaper it is to run, and it is only after great consideration on the part of the Engineer-in-Chief and the manager of the Produce Dépôt that it was decided to separate the slaughtering portion of the works from Port Adelaide, and the chief reasons were these. It was necessary to keep extending. We can assume that. The position at Port Adelaide is an exceedingly cramped one, and there is no room to do what we desired to do. The land requires a great deal of filling up, and there is the need of separating from the dépôt as much as possible all noxious smells or anything that may taint the produce or be used in argument against the produce on account of its proximity to the dépôt. For these reasons, and also to enable by-products to be dealt with, and the need of having a place to paddock, led the department to see that on the whole it would be better if the business were separated. I wanted to take this opportunity of giving you the reasons instead of you getting them second or third hand later on. Last year was exceedingly successful so far as the Produce Department was concerned, and I am sure you do not mind my mentioning the Produce Department so often, because that really is the department within the administration of the Minister of Agriculture which most concerns agriculturists. Last year was successful not only in regard to the amount of business done, but as a commercial concern also it was a success. It produced over 4 per cent. on the total outlay from the time the first shed was put up. I do not want to take credit to myself for that. During last year the success was largely due to my predecessor in office, Mr. Butler. He was an exceedingly good manager, and most indefatigable in his efforts in this direction. I want to say a word or two now about the export of rabbits. It has advanced by leaps and bounds, and although every one in the room would be glad to say that there was not a rabbit in South Australia, still it is satisfactory to know that there is some kind of a silver lining to our misfortunes, and that we are able to extract some good from the rabbit. We sent away last rabbit season 407,096 rabbits, and this year 909,320 rabbits, or an increase of more than 100 per cent. So we have managed to send away a tremendous lot of rabbits, and they have brought a good deal of money into the colony. There are still left some rabbits that might very well be sent away. There is a splendid opportunity of sending hares away in some places. Talking about the Produce Department generally, I do not want to hide the fact that while the South Australian portion has done exceedingly well, the London wine dépôt has not been so successful, and the small amount of wine that is being sent through the dépôt, coupled with the cost to the State of maintaining the dépôt, is giving a good deal of concern to the department. We sent through the dépôt last year £7,000 worth of wine, and there is a loss on the transactions of the London end of getting on for £5,000. That is paying pretty dear for our whistle. It has to be considered that owing to the short vintages during the last few years there was very much less wine for export than previously, but as representatives of the taxpayers, you can see that we will not be able, unless some changes are made, to continue to keep the business on the same lines that it is run now. Of course one can not help recognising that Mr. Young has many difficulties to contend with. He is doing as much as one man can do.

He has such a large number of small parcels of different varieties of wine to deal with that can never be followed up by a continuous supply. He is never sure when he places an order that he will be able to get a similar wine say next year or the year after, that makes his task a herculean one. He has done very well, considering. At the same time, the position is as I put it before. It has been suggested that central cellars should be established by the Government for blending purposes. There are difficulties in the way of that. It is easy to establish the cellars, but the Government may find themselves in the position of having the cellars and somebody else having the wine. Another proposal is that a company should be formed, with a Government guarantee behind it. There are difficulties in the way of that too. It seems to me that some alteration will have to be made. On the other hand, there are suggestions for the amalgamation of the London Produce Department with the Victorian Department. That is, perhaps, worthy of consideration, and when any definite proposal is made, it will be considered. You will notice that some slight alteration has been made in the method of supplying bulls for improving the dairy herds to the practice which previously obtained. We are now trying to bring about the co-operation of private and State enterprise in this matter. The object is to give the Branches a greater interest in the animal, and let them feel less dependent on the State than if the bull is presented to them. The Government are going to give a subsidy to enable the Branches to purchase such animals. The question of agricultural education is one of the greatest importance, but if I commence on this subject I am afraid I would keep you here till nobody was left but the Chairman and myself. Still I may say that I am not going to allow this question to rest until I do all that is possible. I hope the producers will back me up on the question of agricultural education. The Fertilisers Acts will have to be amended this year. There are some difficulties in administering them to the best advantage, and it is one of the most important things that the producers should have a guarantee, that they should be really certain when they paid their hard-earned money for fertilisers that they got what they asked for. There will be an amending Bill brought in as early as possible, adopting the methods which have been followed with success in America and other countries. I do not pose as an agriculturist, but I am extremely pleased to be here and to see the way the gathering is attended. I believe the Bureaus will do even better work in the future than in the past. I do not want to touch on political questions. (A voice—"It is not allowed here.") And a good thing too. There is a proposal now before Parliament, which the Government support, to enable the staff of the Agricultural College at Roseworthy to show what can be done, not only with one type of soil and a light rainfall, but also with a better soil and a better rainfall, and I hope that the proposal will be carried. I think I have dodged politics pretty well this morning. I hope the present prospects will continue. We have all seen the rainfall to-day; it is a nice little downpour, extending well up to the drier parts of the colony, and I hope the prospects will become still better and that we will be able to rejoice on entering the Federation on being a State containing a prosperous, comfortable, and happy community. (Cheers.)

Mr. W. C. GRASBY (Central Bureau): I move that the thanks of the meeting be accorded to the Hon. Minister for his interesting address. In doing so I ask the Chairman's permission to refer to a purely personal matter. [He then referred in highly eulogistic terms to the character of the General Secretary, and the valuable nature of the public work conducted by him, and stated that, owing to commendatory remarks published by that gentleman concerning methods adopted by the speaker whilst in charge of the Oakbank public school, and subsequently, when he had given up that institution, the work of his life had been greatly and advantageously influenced and diverted into an entirely new channel. With permission of the Hon. Minister of Agriculture (which

was necessary since Mr. Molineux was a civil servant) he presented him with a copy of Webster's International Dictionary].

MR. MOLINEUX: I second the motion. I thank Mr. Grasby for his kind expressions and you for your approval.

MR. KELLY: I support the motion. The Minister of Railways in New Zealand stated in May that he was following out the policy of the Great Western Railway, Glasgow, and carrying all manures on the lines free of cost. The Minister has further stated that this has been of immense advantage to the colony. For every truckload of manure carried it is found that two or three extra ones returned with produce. That is an immense advantage to the railway authorities and also to the colony generally. This policy should be adopted in the colonies. Professor Lowrie has done splendid work in the direction of improved farming and the use of fertilisers. I am confident that owing to the use of manures there will be about half a million more bushels of wheat to export. Professor Lowrie is too cramped at the Agricultural College. He only has 1,400 acres, 650 acres are under crop, and 450 acres in fallow. The young men on the farm should have more practical experience in sheep, stock, and other matters.

MR. VENNING: I also support the motion. We have enormous quantities of wheat, hay, and chaff along the railway line, and the Government or someone is to blame that they did not try to get some of it into the South African market. For the crops growing before us we will have no storage room. I am sorry to say that we as South Australian farmers have not sought for a reputation that producers in other countries do. We are somewhat to blame in this direction. I am glad the Government have wisely turned the rabbits to some account.

MR. KELLY: This time last year I was very ill and a vote of sympathy was carried at your Congress. I thought it was so kind of you, and I wish to thank the mover and seconder of that resolution, and you gentlemen for carrying it.

The motion was carried.

THE MINISTER OF EDUCATION AND AGRICULTURE: I thank you very much for the vote of thanks. My thanks are due to the Bureau for giving me the opportunity of coming here and speaking, and also to those present for the sympathetic hearing given me. I would like to reply with respect to the matter mentioned by Mr. Venning. There was a request from the Imperial Government for pressed hay for India. I had the request sent all over the place without any result. I claim, therefore, that I was justified in saying the hay was not obtainable. Nothing but pressed hay was, of course, of any use for shipping. The only offer was from the Agricultural College. This year we are going to have any amount of hay, and I am only sorry that the War Office has obtained all they require. I am exceedingly pleased to be here, and I know I can speak for several other members of the House who have been present since the proceedings opened.

THE CHAIRMAN: I find some difference between what fell from the Minister and what is contained in my paper. The Minister speaks of South Australian butter and South Australian produce. By this time we should have everything Australian, and it will be so henceforth. (Hear, hear.)

Chairman's Address.

THE CHAIRMAN MR. F. E. H. W. Krichauff) read his annual address.

Our twelfth Congress promises to become even a greater success than any former one if members of Branches near railways have availed themselves of the greater facilities now granted, which had been denied to us until the year before last, and this year is still further extended. Unfortunately the same facilities cannot be offered to members coming by sea or residing away from railways.

So far, this season promises to be the best for many years past, and I think I may congratulate you generally on your prospects of at least a good, and I hope, a paying crop. At the same time you will realise that your position will not remain the same as before, under the Australian federal customs tariff which will soon be established; and, if you hope to reap any benefit from the enlarged market—which all true Australians have so much desired in spite of frightened provincialists—great exertions will have to be made and all your intelligence required. Exports, I expect, will also, more than ever before be shipped to the markets of the world as “Australian” produce, not as “Victorian,” “Tasmanian,” &c. The importance of our new position will therefore be such that, while we try to forward the interests of this province, we also do credit to the great Commonwealth, embracing all Australia and Tasmania—or almost the whole of the fifth division of the globe.

It has not been the custom to discuss any of the questions with which the Chairman’s address may deal, nor, of late years, to refer at length to topics which the yearly report mentions; but I cannot omit to state with pride that the present number of Branches is 107, a number which could still be increased if economical reasons did not prevent their formation too near to each other. You will permit me, however, to refer to a few matters which appear to me cannot be too much ventilated.

With the resources which we have, it is unwise to make the wheat crop too prominent, although it may again be not advisable to restrict it too much, compared with former years, on account of the low prices lately ruling. These may leave little profit, unless in a very favorable season, and with an outlay in fertilisers which may not be within the reach of all our farmers. We must, however, consider—and I believe most of you have done this—that the market for wheat cannot be foretold during any six months of a year. The production, and in lesser degree the consumption, of wheat over the world is influenced by too many circumstances to admit of any predictions ever approaching accuracy. Extraordinary crops are sure to be followed sooner or later by poor crops, even in countries which frequently rule the price of the “staff of life,” and the wheat-consuming population being undoubtedly increasing, a better price may occur between sowing and reaping a crop. Unfortunately I cannot congratulate South Australia upon the total result of last season’s harvest, although many of the good farmers reaped very fair crops; but the price was low, and the only chance of contending with low prices is to produce maximum crops.

I look with satisfaction to the great advance our farmers have undoubtedly made in rational husbandry when adopting the drill and using commercial fertilisers. Taking my figures from Mr. Summers, the Inspector of Fertilisers, who certainly can best judge of the quantity imported or home-made, it seems very likely that 24,600 tons have been used this season, chiefly for wheat, or probably half as much again than last year. This is a highly encouraging matter, and as the Marquis of Salisbury said many years ago, “If farmers would only manure their lands with brains, as the painter mixed his paints, there would be much less heard about agricultural depression.” It is, perhaps, not quite so bad as Mr. Frank Wallis, of Lincoln, said in a lecture to the Southam Farmers’ Club on the 27th December, 1898—“This century will be memorable in some future history as the British fertility-denudation age, feeding the towns, and giving not a sufficient equivalent of manure back.” Until lately this certainly applied to most of our farmers, who did not even try to maintain the natural fertility of the land fresh from the hands of the Creator, upon which Great Britain hoped to quickly see a well-to-do yeomanry settled. How many of those who took land in the four first decades of South Australia’s colonisation have misused this grand territory by taking payable—yes, highly payable—crops from their land, returning nothing to keep up fertility?

The renowned Baron von Liebig once said to the King of Bavaria, "It is not careless agriculture, so much as the destruction of the fertility of the fields by means of constantly removing crops without returning anything, which put an end to the great Roman and Spanish empires over almost the then known parts of the globe." No! Great numbers of our first settlers traded subsequently with the land, sold out, and went northwards, or to the other colonies upon new lands, and exhausting the fertility of these as well. And thus, by this nomadic life, and frequently much more by the profits of the sale of their first farms, they became fairly prosperous compared with those who had purchased from them. Unfortunately a large number of our best and permanent settlers are those who purchased these improved (?) farms, and had their hands well tied by mortgage or lease at high interest or rent. But as many of them have almost been starving themselves and families to keep on the land, and eventually fairly succeeded, let them economise again for a year or two, to feed their land with commercial manures, and success can hardly be doubted, such as has been recorded from so many parts of the province. If it is a fact that England produced in the fifteenth century only from 6bush. to 9bush. per acre, we have there an object lesson what great crops intelligent farmers can now grow with the aid of improved implements and the use of manures. And who deserves more our thanks in leading the way towards this mighty revolution in practical farming than the late lamented Sir J. B. Lawes, whose death has been telegraphed only last week? Of him we shall always be reminded, although we have not been to Rothamstead, or have not perused all the valuable reports of experiments there made, when spreading on Australian soil Lawes' superphosphate. Our wheat-growing was nearly played out, and threatened to become in many localities a thing of the past; but by restoring the fruitfulness of the soil with commercial manures, it appears that all more intelligent farmers can weather the storm, and with fairly favorable seasons they can still feed South Australia's population and a few hundred thousand customers elsewhere. Of course, if some farmers think they may use the smallest quantity to start a crop on, after exhausting almost the natural supplies of quickly soluble plant food, they may obtain a fairly payable crop; but the land is frequently left as poor as before. For those who can do it, it is certainly not profitable to screw down the quantity of manure to the exact manurial requirements for any particular crop. Every 1cwt. of most of the commercial manures over and above the immediate use for any particular crop growing, is a reliable and a profitable investment for the future, and in our dry climate even more so if rain falls after a dry season. The crop must be in a position to make up for the suspended growth by being able to obtain at least twice the quantity of plant food, and this they can only do when there is a superabundance of it in a readily soluble condition close at hand. But it has been found that the solubility of phosphoric acid in the soil itself fluctuates between less than 1 per cent. up to 3·4 per cent. Phosphatic manures especially should be always in excess in the soil. It is never lost, but remains in the soil as a non-acidulated manure, like Thomas phosphate; this is well known by all who have used it for years. Superphosphate is quick-acting and may be more useful for the time, where you, as I said, did screw down manuring to one crop. An application of 5cwts. per acre of a phosphatic fertiliser, with some potassic manure and nitrogen, to grass lands—if you will not exclusively use all your farmyard dung for them—is very advisable, and if anything is still better, go actually to double that quantity. Such is the advice of persons who bring their land quickly back to fruitfulness. There are yet farmers who, accustomed to the use of bulky farmyard dung, hold to the opinion that *one* of commercial manures, even if it contains only one of the plant foods—in most

instances phosphoric acid—is all that is required to give to the land sufficient fertility; and this is sometimes not combated by firms anxious to obtain for their manure a large sale. So long as this is a so-called “complete manure,” there is at least the probability of obtaining a fair crop, but perhaps at an unnecessary expense for the farmer, whose land might have had no need for all the three plant foods, or in the proportion in which they are mixed. If any one of these is contained in a smaller proportion than needed for a crop, it settles what harvest you will obtain if the other plant foods should be present in ever so large a quantity. So you may pay in a complete manure for a comparatively large quantity of the expensive nitrate of soda or sulphate of ammonia, and actually use this for a leguminous crop, which should find nitrogen for itself and a subsequent crop as well from the air. For the money so actually wasted a much larger quantity of a phosphatic or a potassic manure could have been given to your crops and increased it. Much nitrogen given to peas will give you much straw and but few pods. Our aim in manuring is to have an increased, even a maximum, crop, but one that gives us a net profit, and not perhaps one which merely balances expense and return. The greater proportion of our fields are now, as regards phosphates, much below the standard of producing a maximum crop, and a good wheat crop of 33bush. demands 30½lbs. of phosphoric acid per acre; but this is no reason to forget that perhaps 32lbs. of potash, or 70lbs. of nitrogen, or much lime, may be also required. To ascertain this by experiments is not always troublesome, and at all events it will pay you handsomely. A few turns with the drill with one manure, again with a larger quantity thereof, and again a few turns with another, or two mixed will soon show what your soil wants. Negative results are almost of as much interest as positive, both affecting equally the financial aspect. The only possibility of pursuing agriculture profitably is to work hand in hand with nature. She is a powerful and wealthy partner which can provide you with the most expensive nitrogenous plant food through leguminous crops that are not nearly enough cultivated. But what nature can but seldom do is to provide you also with phosphate and potash. Unions can do this cheaply for its members by purchasing in large quantities, especially if a savings bank and loan bank are connected with the union. These are a great blessing for the farmers. In Germany 53 per cent of the farmers are members of such unions, and they do not only receive seed, manures, and a variety of implements and other articles at a lower rate and of the best quality. Many of them, although in a good position, may be at times unable to pay cash down, and, therefore, obtain a loan from such bank at a cheap rate of interest until able to pay. Even those who are not members of unions derive benefit from them, as merchants and others are obliged to lower their prices to some extent to be able to sell anything. Where the manager and directors are acting businesslike there should be but little danger of coming to grief. They are responsible; but the members are sure to elect only those in good positions and business men. Here, probably, the extra cost charged by intermediaries at retail prices, who expect a profit and must insure themselves against losses from bad debts, as well as the fact that farmers do not possess the cash, may cut down the use of commercial fertilisers. Besides, if farmers receive them through a union they have a specific guarantee of their composition, they having been analysed from a large bulk. I understand that our Farmers Union here has made of late good progress, and I hope that it will soon be in a position to do all for its members that a union is expected and able to do.

With a view of collecting for publication—with European and American experience also—condensed information from all who have not the earlier volumes of the Bureau, of all results of manuring our principal agricultural plants obtained by members of Bureaus, I have gone over the whole of the

volumes of our *Journal* since 1889. I then found that considerable interest was always shown by some members of the Branches in the seeds which were distributed for experiment by the Central Bureau. At one time 8,000 packages were sent out, at another time 14,326 packages of 98 varieties, and later on, once, 1,000, but subsequently only very few packages were received, not purchased. The results have been not always cheering, our climate being so fickle; but it is a pity that our funds do not allow a continuance of distributing seeds likely to be useful. Gifts from private persons of seeds or plants were also formerly received, for which we had to thank His Excellency the Lieutenant Governor, F. Lamson Scribner, of U.S.A. Department of Agriculture, F. C. Smith, R. Marshall, F. M. Bailey, F.L.S., the late Baron von Mueller, and others. Now these presents arrive but seldom. Out of many remarks made in connection herewith by different Bureaus, I mention only a minute of the Stansbury Branch - "The raising of new plants, &c., from seeds supplied by the Central Bureau has met with considerable attention, and some splendid vegetables and fodder plants thus raised have been tabled by members." The Bureau has also in another respect not been as useful as formerly, inasmuch as the visits to Branches are now very rare by members of the Central Bureau and others. Of course to visit the farms, vineyards, and orchards within a district by the members of a local Bureau is very desirable, and carried out in many instances; conferences also assist; but members of the Central Bureau might not only give advice, but gather information themselves which would through them become valuable for the whole of the Bureaus.

On the whole, however, there is no doubt that the opportunities for becoming better farmers, dairymen, vigneron, orchardists, and horticulturists are gradually given, and pastoralists are not quite forgotten either. Late Ministries, and especially the Ministers of Agriculture, are more inclined to forward the interests of the rural population. Our Agricultural College, under able Professors, having already shown what can be done in a somewhat dry locality with mostly only medium soil, last year was allowed to purchase some adjoining lands to give more opportunities for practical work by the students, and to show results to visiting farmers. It is the hope of the Council of the College and of the staff that further purchases will be made, to give more room for sheep and cattle, and, also, on better soil for cultivation of fruit, &c. Our University has included in its curriculum for B.Sc. in Agriculture, agronomical subjects. The various Australian departmental journals, as well as the monthly and weekly papers, supply agronomists of all classes with such mental food as cannot fail to be a help to them; the annual report of the Agricultural Department and the monthly *Journal of Agriculture and Industry* are studied by many who are not members of any Bureau.

Finally, the Bureau is an institution which undoubtedly has come to stay, not, as even such a good member of it as Mr. R. Caldwell, M.P., at one time was inclined to think, would soon collapse. The vitality will not die with the older members, who have started the 107 Branches; younger men have taken, and will doubtless take their places, and show as much enthusiasm, energy—and, let me say "tough perseverance"—as is the provincial, almost proverbial, character of our South Australian cultivators of the soil and of other ruralists, who have to fight pests and diseases, and try to apply science with practice against a somewhat uneven climate, so as to develop our resources and prosper themselves. Our members have given, without fee or reward, their ripe experience; their experiments may have given a greater charm to farm life, and in many cases a good profit; they are, one and all, animated by patriotism for the welfare of this province, and henceforth the Commonwealth; for Dean Swift's classic phrase "The man who makes two ears of corn or two blades of grass grow against one before" has far-reaching issues for individual farmers and the

whole community, provided the increase has been achieved by improved cultivation, and by well-balanced, profitable—not wasteful—dressings of the plant foods. To cultivate and manure with brains should be our watchword!

Mr. J. SMITH (Hawker): If the farmers of South Australia would pull together they would be able to get on far better than they have done in the past. We should take the Chairman's speech home and study it, and teach it to our children. If we have not united as we should have done let us try to make our children unite. The Farmers' Union is helping to bring farmers together. I hope the remarks of the Chairman will help to make us unite more than we have done in the past.

Mr. J. MCCOLL (Richman's Creek): I agree with the Chairman that we should manure with brains. The best way to experiment is on small plots of ground. In the far northern districts this year we have commenced to use manures, and I believe we are going to be successful. We have no guarantee that we are using the best kinds, and we should experiment so as to get the best results from the soil. If we manure with brains the general average of the colony will be very much increased.

Mr. E. H. WARREN (Aiden Vale): I believe it has been clearly demonstrated that manured wheat will grow with less rainfall than unmanured wheat. Professor Lowrie said that it has been proved in the North that with 8in. of rain and manure judiciously applied you could grow more wheat than you could with 13in. of rain without manure. I am not positive as to the figures. Many are of the opinion that with manure you require more rainfall.

Mr. MOLINEUX: The Professor said the rainfall was to be within the growing period.

Mr. D. F. KENNEDY (Kadina): We should try and make use of the Farmer's Union more than we do. We should use it to purchase our implements. The union should get the machines at first cost.

Mr. W. TOWILL (Bowhill): There are very light soils in the colony which it is impossible to farm on at a profit under the old system. In the Murray districts there are hundreds of thousands of acres of light sandy land which it is impossible to do anything with under the old system of farming. But seed drills and artificial manures make all the difference between failure and success. I have tried the seed drill with manure and without manure, and the difference in the return is something wonderful. If we could get the land taken up in the Murray district and have it worked on the proper lines there would be a great future for it. At present the scrub land is teeming with dingoes.

Mr. A. L. McEWIN (Brinkworth): If the Government would carry the manure free of charge they would be doing more practical good for agriculture than by advocating agricultural education in the State schools. The fertilisers will enable me to remain on my farm, but the money I spent on the carriage of manures should have gone for the purchase of more manures. If the Government are going to spend money on agricultural education it should be done at the College.

At this stage the Congress adjourned till 7.30 p.m.

EVENING SESSION.

Dieback of Apricot Trees.

Mr. MOLINEUX: These apricot branches are from Mr. E. M. Sage, of Pinery. The trees were affected with "dieback." We advised him to try manure. He used 3cwts. to 5cwts. of superphosphate to the acre. The result is that the trees are perfectly recovered, and are as healthy and vigorous as anyone could wish to see. Some trees he did not apply any manure to, and they are all dead.

Provision of Fodder for Seasons of Drought.

Mr. WARREN read the following paper :—

As the time at our disposal is short, I will be as pointed in my remarks as possible. I do not pretend to advance anything new on this subject other than can be gathered from four-fifths of the agronomical and other information that we read. It may be mentioned that good advice cannot be given too frequently, till—it is generally accepted and practised.

The whole of South Australia is more or less subject to seasons of drought; that portion lying outside Goyder's rainfall line in South Australia more particularly. It does not need a "Joseph" to predict that lean seasons will come in this colony, and we are apt to have greater faith in the country than, taught by experience, it deserves; and some of us lack the wisdom of Pharoah in making provision of fodder in the good seasons for the bad ones which are bound to come. The old Egyptian story has a very modern application, though in our case more to our stock than to ourselves.

Farmers are largely to blame for loss of stock by starvation in drought seasons. I myself was a heavy loser in the late drought, and must say that had the "cocky" chaff which was burnt in good times been saved, most if not all the loss could have been avoided.

In either one or other of the ways enumerated below I think it is possible in good seasons to make provision for a period of scarcity, according to district.

Ensilage.

Rarely in our district is there sufficient growth of feed to admit of any provision in this way—the rank growth of oats on land to be fallowed might be utilised (if the land is not needed for next season's crop, when of course it should be fallowed early), giving a lot of fodder and clearing the land the same time. The plains, however, in good seasons yield a fine growth of clover, geranium, and barley grass, which can readily be converted into silage. Mr. H. French, of Willochra, made about 30 tons of stack ensilage in 1889, which was afterwards fed to horses, cattle, and pigs with great success.

Straw.

The value of straw to sustain life depends upon the rapidity with which it is gathered after reaping. I look upon it as poor food for horses, though if cattle have a stack of it at their disposal they eat a lot of it during the early winter. Straw of top value can be obtained from the Stienwedel variety, which on a hot day will admit of reaping when the straw is still of a bright yellow color. This will give no decrease in the wheat yield, though some trouble with white heads, and if the straw is cut and carted at once it will be found very valuable in seasons of drought. Needless to say a straw stack is greatly improved, softened in texture, and made more nutritious by dressing of salt or solution of molasses.

The value of the binder and header has been so often demonstrated that I need not refer to it here.

Mr. Pearce, of the Arden Vale Branch, informed the members that he had succeeded in establishing several bushes of tagosaste, or "tree lucern," of which the stock are very fond. Might not more be done with this plant. Its value in dry times would be very considerable.

Cocky Chaff.

One of the most important products of the farm is the wheaten chaff, and, if it is saved and protected from the weather, it will certainly come in handy sooner or later. I prefer it to straw, because it lends itself more readily to the addition of more nutritious food. In my district crushed wheat is largely used to mix with the chaff. Instead of each farmer having a crusher, it would pay to co-operate in the purchase of one that would supply the demand of a number of farmers. The protection of large heaps of "cocky" chaff from the rain entails a lot of labor, but it is labor well spent when the season of scarcity approaches. Bales of straw would be admirably adapted for the building of chaff houses; there again co-operative effort in the purchase of a continuous straw press would be useful, not only for protecting the chaff, but for conserving the straw also.

Hay and Reserve Paddocks.

To make provision for drought in the northern districts, I can readily give the following advice: When there is a heavy growth of hay, cut a stack more than will be needed for present requirements. Save all "cocky" chaff, and, if the area is large enough, always carry one paddock of feed over from year to year. A large straw stack only costs the labor, and, in our erratic climate, is sure to be needed.

Mr. C. PEARCE (Arden Vale): I should like to express my opinion on the tree lucern. It seems to me that it is a very useful fodder plant. I got a few seeds from the Central Bureau many years ago, and put them in in a rough manner, and they seemed to exist for a few years without any attention at all. I shifted them up from the dry part of the garden to where there was some water, and since then I have found out what an ornamental tree it is. I planted two or three of these during the last two years, and they have had good attention and been watered regularly pretty well all the year round. Within two years one tree has grown over 6ft. It struck me if some of these trees were planted in watercourses they might prove very advantageous in time of drought. I indorse Mr. Warren's remarks about cocky chaff. I was greatly impressed about this cocky chaff a few years ago. Just before the great drought Mr. Kelly told me to look after the cocky chaff. I thought he had cocky chaff on the brain. But he spoke words of solid wisdom, and I have not forgotten to profit by his words of advice.

Mr. MOLINEUX: There has been the difficulty at first of getting the stock to take to tree lucern.

Mr. W. GREEN (Gumeracha): Some of the varieties are not suited for fodder.

Mr. D. F. KENNEDY (Kadina): My cattle did not eat the bush at first, but they took to it after a time.

Mr. J. W. DALL (Nantawarra): One of our members said he had a tree hanging over his fence and that the cattle did not touch it. You seldom see cattle or sheep eat this bush when there is grass about. You should educate the cattle to feed on it. In my part the farmers are of opinion that Purple Straw or White Tuscan are better for straw than Steinwedel. Stacking cocky chaff is one of the greatest difficulties we have to contend with. We have tried heaping it up and putting straw round it; but when it comes to unstore it the difficulty begins.

Mr. G. STONE (Port Germein): I saw the necessity, when I went into the matter, of saving fodder for times of drought. We have always saved up the chaff and a good deal of straw. We have gone in for a thrashing plant. When you have a good crop it will be a good plan to cut 25 per cent. in the dough state and then thrash it; then you have a good heap of stuff for two or three years. Steinwedel does not make a good hay or a good fodder when thrashed; there are other varieties far better than Steinwedel. In our district some farmers have been stacking cocky chaff by bringing it up perfectly straight like a sugarloaf, and the rain does not penetrate it; it is well trodden down while being built up. There is some in Baroota that has been standing two years. We have in the season of plenty to provide for the seasons of scarcity. In connection with thrashing, you always get 2bush. or 3bush. more; that has been my experience. You get an increased weight and you lose no grain.

Mr. MOLINEUX: I have seen it reaped in the dough state, and the wheat has been heavier and brighter, and there has been more of it and more gluten than if it had been left to get dead ripe. For every day the straw is left you lose a portion of sugar, of oil, of starch, of gum, and of aroma.

Mr. BROWN (Port Elliot): King's Early beats Steinwedel for hay by a fortnight and the wheat is about as much again compared with Steinwedel.

Mr. R. HULL (Colton): I have tried Steinwedel and Purple Straw, and I have found the horses eat Steinwedel straw much more readily than the other. It is softer by nature than any other straw you can mention. It is a very bad wheat for hay but very good for straw. I think it is far before cocky chaff if you only have a chaffcutter. I believe cocky chaff injures the constitutions of horses if they are constantly fed on it.

MR. NEAL (Wilson): Steinwedel is the best wheat we can grow for straw, because we can often get no other to mature.

MR. J. ANDERSON (Port Lincoln): I think we should take advantage of the surplus fodder this year and keep it for years of drought. Silage is a very important subject. The objection to the dry silage is that a considerable quantity of the outside is rendered useless, but that can be avoided by a good sprinkling of salt on the outside of the stack. In a season like the present we should take advantage of the feed and see that it is not wasted.

MR. GEO. ROBERTSON (Wandearah): There is not a more important subject to farmers than the consideration of the question of fodder; but we could not be expected to provide fodder for a three years' drought such as we have had. I have been very successful with ensilage, and I have done all I could to influence my neighbors in this matter. I had two pits put down and it was two years before I opened them up, and the stuff was in a perfect state of preservation. Anything that the cutter will cut in the green state will be improved by making silage of it. I believe it will keep for twenty or fifty years if put in the pit. I have had no experience of sweet silage.

MR. J. HILL (Maitland): In good seasons there will be straw. All the way down the railway line there are thousands of tons of straw, and with a binder and header we can preserve it in a good state. I recommend those in the better districts to grow more oats. I have one stack of straw saved since 1897 left.

MR. GRAY (Amyton): I think we have been somewhat abused over this matter in the North. Our experience before the last cycle was that we only had one year of drought, followed by a fairly good season, or a really good one. Then our experience has been that we have to do a great deal of water-carting, and we found that by going from 170ft. to 200ft. we could strike water. That took up a great deal of our energies. We have had seven years of scarcity. That is a thing we have never experienced before, and it would have been impossible to provide for it. Since 1893 many of us have not had a crop we could get a decent stack of hay out of. Ensilage is an important matter. I think with wheat at 2s. 6d. per bushel it will pay to cut the crops for ensilage and feed them to cows. I think the best way to save fodder is by means of the binder and header. My experience with cut straw is that it is just worth the labor of saving it and no more. There is a great deal of difference between straw saved by the binder and that saved by the horse rake.

MR. WHITTAKER: Mr. Warren recommends that salt and molasses should be placed with the straw. I do not see any benefit from molasses.

THE CHAIRMAN: The matter was thrashed out at Bordertown, and all there who had tried molasses praised it.

MR. WARREN: Molasses contains a lot of sugar, and that is very nourishing. At the same time it softens the texture of the straw, which is an important aid to digestion.

MR. NOLL (Quorn): I have taken a ton of straw from the binder and mixed it with a ton of good hay, and it has been as good as two tons of good hay.

MR. MOODY (Mallala): The drawback in the way of providing ensilage is that it is necessary to store it at a time when you should be working the fallow. A loss of one or two bushels on the following crop would not be compensated for by ensilage. Like Mr. Stone, I am pretty well provided with fodder, and I have been using the binder and header for the last five years. I began in a small way, and I think I may say I have just about dispensed with the stripper. I am not one of those farmers who can afford to run a thing as a hobby. I believe it will pay me to continue heading and binding. The machine I am working finishes the job right out. I tried cocky chaff, but almost in every case it was very objectionable for stock after the first year. I found it became affected with a small beetle, and no matter how I protected it from the weather it turned yellow.

Mr. VENNING: Some years ago for the sake of prize wheat we reaped the wheat early, and my brother and I followed with the sythe. Afterwards we carted the straw and chaff into a yard, and it was eaten up readily. When we get a luxuriant growth of grass we gather it and store it in a stack, and it will last several years.

Mr. T. HARDY: We have a little to learn from other countries similar to our own. I had an opportunity of being in Tunis, in the north of Africa, and it struck me what a large quantity of "prickly pear" was growing there. I made inquiries, and I found that some kinds were grown for fruit for the people to eat, and they were constantly in the markets, and considerable tracts were planted with the kind with no prickles on. I brought some of them out to Mr. Holtze, and he is growing them. In Tunis this plant is a standby in case of drought. It grows anywhere. They do not cut it till the bad time comes, and then it grows up again. The one I brought out will take a few years before it is ready for distribution. The one in my home from the gardens is almost free from prickles, and anyone could get a few leaves from Mr. Holtze. The press should be one of the means of getting over the cocky chaff difficulty. The machine turns out bales of pressed straw which can be used for putting up sheds, or for a framework to contain the cocky chaff. I think a few could join together and purchase a press.

Mr. WARREN: I did not contend that Steinwedel would make the best hay. I said it could be reaped when in the green stage. I would rather abuse the farmers if I thought it would do them any good than flatter them.

Standard Sample of Wheat.

Mr. MOLINEUX: The report of the Conference on the standard sample of wheat appears in our *Journal* in full. There were good reasons why I did not vote. I was called on at the last moment to take the place of Mr. Goode, who was ill. When I heard the arguments used by the advocates of the present system, I could not see how I could honestly vote against it, because on our side there was nothing definite put forward. I was still further influenced in not voting by the fact that the greatest wheathbuyer said that he would not abide by any fixed standard. The sample sent out by the Chamber of Commerce was only 63lbs. and it had a good deal in it that was bad, but, if no samples that had not been subject to deduction on a 63lbs. average were put into the bulk forming the present year's average, and as we know that many samples sent in weighed much above 63lbs. per bushel, it seems difficult to consider that it was a fair average sample of the colony. Somebody said he was glad to see in the sample bunt and whiteheads, because if it was absolutely clean, and a cargo was sent home containing whiteheads and bunt, there would be arbitration and all the rest of it.

Mr. MILLER, M.P. (Central Bureau): I represented the Agricultural Bureau at the Conference. He noticed an omission in the report. The weight of the standard samples from Victoria and New South Wales was not given. One was 61lbs. and the other was 62lbs., he thought. We know something about the ins and outs of growing wheat and disposing of it. Mr. Darling, in criticising Professor Lowrie's statement, said: "With wheat at 2s. 6d. a bushel, the difference in the value of a 63lbs. bushel and a 65lbs. bushel was only $\frac{1}{4}$ d." Then why were they docked a penny when they were a pound under the standard? To quote Mr. Darling's own words, "Roughly wheat was worth last season 2s. 6d. a bushel, or $\frac{1}{4}$ d. per pound. So, on that reckoning, the difference between 63lbs. and 65lbs. wheat would be 1d. a bushel on the whole crop. Still, what they lost in flour in the lighter sample they must gain in something else, and so there was more offal. Reckoning, therefore, the bran, &c., they got back, the loss was reduced to $\frac{1}{4}$ d. per bushel, or

£7,291 16s. 8d. on the whole crop." For the last ten years the standard has only varied from 62½lbs. to 64lbs., and for six years it was 63lbs. I would like to see the continuance of the standard, and two grades. When we found out that the intrinsic value of wheat is only ½d., we did not see why we should fight for the higher quality wheat, unless we could have two grades. The farmers in Victoria are taking a great interest in things affecting them, as I saw when I was there last week. They are sending thousands of tons of horsefeed to Africa and also horses to India. I was reported in one of the local papers as being a weak debater; but I think I know what we want in this matter, and I am willing to do all I can for the agricultural interest. When we have intercolonial free trade you should study everything in the agricultural interest for your own sakes.

Mr. WARREN: We think it is only right to have a continuance of the standard of 63lbs. Let us have an increase for wheat over that and a corresponding deduction for what is below that. The Farmers' Union last year dealt with nearly half of the wheat in South Australia, and the time is not far distant when the Union will do the bulk of the shipping. We might just as well take the risks ourselves and ship ourselves. I think this matter should be resurrected, and the farmers should stick to it through thick and thin.

Mr. STONE (Port Germein): We were thoroughly dissatisfied with the result of the meeting, and the whole thing should be taken up again. The producers should have some say in the matter affecting the sale of their produce, and it can only be done through union. The whole thing is in the hands of the merchants, and it is time this thing were altered. The only way is to do the business through the Farmers' Union. I move—"That, in the opinion of this Congress, the result of the recent conference on the standard sample of wheat is unsatisfactory to the wheatgrowers of South Australia, and that we request (a) that the farmers have a direct representative at the fixing of the standard for the season; (b) that the standard be fixed as early as possible; (c) that a better system of sampling wheat be adopted by the buyers; (d) that a system of grading should be adopted." In our district we are quite finished when the standard is fixed.

Mr. J. G. JAENSCH (Murray Bridge): We could only get the top market price for No. 1 wheat, and we would have to accept a reduction for No. 2 standard, and now we get the top price for the 63lb. standard.

Mr. WARREN: I suggest that the matter should be referred again to Professor Lowrie.

Mr. NEAL (Wilson): We cannot grow more than 63lbs. in the North. If we raise the sample to 64lbs. it would open the way for more docking than at present exists.

Mr. BROWN: If I have wheat above the standard I am paid for it.

Mr. JORGENSEN (Mount Remarkable): I second the resolution.

Mr. J. B. ROWE (Arthurlton): Many of us are afraid to go through our wheat twice. It would pay to do that though. If wheat went 62½lbs. to 63lbs. when put through the second time it would go 65lbs. We should raise the standard to 64lbs. if it was possible.

Mr. FARLEY: If we got an increased price it would pay to run the wheat through twice.

Mr. J. B. ROWE: We might try to get the Farmers' Union to place a cargo of 63lbs. and another of 65lbs. on the English market at the same time.

Mr. NEAL: I move an amendment that the standard remains at 63lbs.

Mr. E. J. HARRIS (Millicent): Each season fixes its own standard. We have to go by the bulk of grain grown each year. The Victorian standard has always been ½lb. and sometimes 1lb. less than the South Australian standard,

and their wheat brought just as much as ours did, and sometimes a little more. The Farmer Union sent home a cargo of 62lbs. grade and another of 63lbs. standard, and the former fetched the very same price as the latter.

Mr. W. MILLER (Petersburg): The cargo referred to was part first grade and part second grade, and it was sold as one cargo, and fetched a better price than the cargo sold a few weeks earlier, which was all first grade. I believe simply because it struck a better market. I object to the amount of the rubbish that was in the wheat sent home by the Chamber of Commerce. Mr. Darling in the past would not be prepared to take that sample of wheat if it was brought in by a farmer. The difficulty is not so much the fixing of the standard. Our trouble is, if we get anything over the standard, we are not paid for it. The time is not far distant when we shall have to go in for a different system of handling our wheat.

Mr. J. W. BOOK (Carrieton): If we want to secure a market for our wheat we must try and supply the quality. Quality always fetched the price. I think two grades could be established with advantage.

Mr. HIRSCH (Hawker): If you cannot get wheat to go 63lbs. by good cleaning, then it cannot have the commercial value a good sample of wheat should have. We should keep the sample up and keep a good name.

The motion was carried.

WEDNESDAY MORNING SESSION.

Improvement and Care of Horses.

Mr. W. HAWKE read the following paper on "Improvement and Care of Horses":—

The horse is without exception one of the most useful and valuable animals utilised in connection with agricultural pursuits; and such being the case, I consider the grand old equine is well worthy of our consideration as an Agricultural Congress. If every horse in South Australia were to die in less than a week we, as farmers, would find ourselves in a very queer position indeed.

There has been a good deal of talk during the last few years of imposing a tax upon stallions, because of the number of scrubby, weedy, under-sized animals to be found in the colony. The reason why so many of the above type of stallions are kept is largely the result of the fact that the well-bred, well-developed animal, that is kept wholly and solely for travelling and serving mares, usually has such an excessive number of mares put to him per season that he quickly becomes a poor foal-getter, and once in that condition it wastes time, money, and patience in trying to get progeny from such. Now, I consider that the two types of stallions spoken of could be done away with if the Branches of the Bureau purchased their own stallions. Let a Branch with a membership of, say, fourteen strike a levy of £5 per member; result, £70. The Government might be persuaded to give a subsidy of 10s. in the pound; result, £35, or a total of 100 guineas. With this amount a very good animal could be purchased. The Branch could limit the number of mares to be served, and charge a small amount per mare to all members of the Branch and more for outsiders who should put mares to the horse. Moneys thus received to be placed to credit of the Branch, and to be used at some future date in replacing the horse should he die, or, if a change is desired, to give the stallion and so much to boot, and so secure a better horse.

If the expense and responsibility of purchasing a stallion be too great for a Branch to undertake, the object sought might be attained by following the practice adopted in many parts of Great Britain: of hiring a stallion for a season or more. The Branch could either obtain complete control of a suitable stallion for the season or could secure the guarantee of a certain number of mares, retaining the right to say how many mares the horse should serve. This would obviate any risk of loss by accident or death, and allow of fresh blood being obtained without extra cost whenever such was considered necessary.

In this way farmers could secure at intervals different classes of horses, as they might desire—heavy draughts, as the Shire and the Clydesdale; lighter draughts, as the Suffolk Punch, and Percheron; or a thoroughbred if they liked. Many farmers consider that it does not pay to breed. They hold that it is cheaper to go into the sale yard and buy there; but in the public sale yard is to be found all the refuse and cast-offs, and it takes a very shrewd man to always buy well. There is always a good market for good, well-developed,

young draught stock, and if you breed such they nearly always fetch remunerative prices. Some again, will say that breeding does not pay, because the mares are too long idle. If mares in foal are used in steady work they may be worked without any harm accruing up to within a week or so of foaling, and after a fortnight's spell they can start again if they are well fed. Again, they say there is the danger of slipping the foal. If only steady work is given, with no big heavy pulls or breech work, there is very little danger of this taking place. Again, there is a danger of mares dying in foaling. This is usually due to inattention and lack of assistance. The mare should be seen last thing at night, at day-break, and also at midnight, when birth is about to take place, and a little attention and help would have saved the lives of valuable mares and foals that die every year. Remember that the laws of heredity hold good in horseflesh as in everything else, and breed from mares that have good points and are well developed, that are good tempered, and without vice, staunch pullers, and that are hardy and will stand work. Remember there is nothing like mother's milk; let your foal get his fair share of it, and he will thrive all the better. I have known foals weaned at two or three months old, and they have turned out stunted specimens of horseflesh. There is nothing to equal a good start when young if you wish for good development in after years. Better to breed two foals and be able to feed them well than have four and starve them.

Do not break your colt in too young. I have seen them in harness before they were two years old, and they never had a chance to mature properly. Better leave them till four years old, and you will get more work out of them in after years. Be very careful with breaking them in, and do not break them down and spoil them. Never hit a sulky colt; take him quietly and he will be the best horse in after years. It is the sulky colts that are ruined in breaking in, and turn out the outlaws of after years. If your colt is too free, and tries to pull all the plough, do not tie his head back or give him long chains; it will only affect his mouth, and make him throw up his head, &c. Have a chain from his swing to the plough, so that if he pulls far ahead he has to shift the whole plough, and before he has gone many chains he will come to the conclusion it is a very stale game, and will quieten down almost at once. I have known the most fiery horses in our district effectually quietened in this way when tying their heads back and long chains only made them worse and also excited the whole team.

Sore shoulders are the bane of many farmers' lives. Have a collar for each horse, and when new soak it in water for twenty-four hours; then put it on in light work and it will pull into the exact shape of the horses' shoulders and neck and fit him perfectly. Clean the collar and shoulders carefully every day; this is one of the best preventives of sores. The main reason of sore shoulders is insufficient horses on an implement, and the farmer who invariably has horses with sore shoulders is the man who tries to pull a six-horse plough with five horses, while the man who never has horses with sore shoulders is the one who puts seven on a six-horse implement.

In conclusion, feed your horses well. Eight horses well fed will do more work than twelve badly fed, while the fat horse thrives on less than the thin horse, and the thin animal is more liable to disease.

Mr. Sissons (Strathalbyn): In what way would the owner of a stallion which was hired by a Branch be secured against loss? The horse would have to be insured, because there is a great deal of risk in hiring a stallion. Suppose he is kicked while the Branch has him, and he was incapacitated, who is to bear the expense?

Mr. HAWKE: It would be easy to insure him.

Mr. Sissons: It is difficult, if not impossible, to say by looking at a horse whether he is any good. Some of the best horses in the colony are nothing to look at in size, and one cannot tell whether he is any good until he has stood for a season or two. I have had a lot of experience in this matter, and it will be a bad thing to interfere with private enterprise as far as stallions are concerned. I do not think the proposal for hiring stallions by Branches will work, as the arrangement with regard to bulls has not been very successful so far. There are many members of the Branches who ignore the Bureau bulls, and therefore it does not pay anyone to have anything to do with them.

Mr. ROBERTSON (Wandearah): This is a very important matter. Many owners of stallions do not take proper care of their horses, and make them travel very long distances in hot weather. They cannot be expected in such circumstances to get foals as well as if they were taken better care of. I saw by the *Australasian* not long ago that about forty farmers in one district in

Victoria banded themselves together, and advertised for a stallion. They guaranteed £4 10s. per mare, and limited the stallion to serving forty mares. I am sure if inquiry is made it will be found that numbers of South Australian horses serve double that number of mares, and this is certain to injure them. Speaking generally on the paper, I think more attention should be paid to stabling. Sheds built of a roof on upright sticks, as so many are, are worse for the horses than turning them out in a field, and to bring a horse dripping with sweat into a place like that and leave him to feed is sheer cruelty. If you put a horse into a galvanized iron shed, or one that is built of palings, he will do better, and keep in better condition on less food than a horse that is not properly cared for.

Mr. BROWN (Port Elliot): I know a little about hiring horses in Great Britain for a season, and the first I hired was about twenty-five years ago. At the Glasgow Show there are always a lot of entires, and committees are formed in certain districts to send men to Glasgow to pick out a horse suitable for their particular district. They guarantee say sixty or eighty mares at a certain price arranged with the owner. The owner takes all the risk, except that if he does not get the number of mares specified the committee have to pay up to the guarantee. I think if a horse is well taken care of he can serve sixty or eighty mares easily. There was a horse in our district that had a reputation for not getting foals. I liked the look of him, and gave him three mares, and got three foals. Two neighbors got four foals and two foals from four and two mares respectively. It is often the fault of the owner of a mare if a stallion does not get foals. Of course I know grooms do not always look after a horse well; but they often have to travel them too far. There is a horse in our district this year which is the best we have had for twenty years, and yet he only got twenty-six mares, because farmers took an inferior horse that was a little cheaper. Serving a mare every nine days exactly is a mistake, and you may never get a foal that way. You should cross the service, and it would not be much trouble for a farmer to take his mares a few miles to meet the horse to do this. He will often get a foal in that way when the regular service would be a failure.

Mr. N. TRAVERS (Carrieton): I do not believe in the Bureaus taking horses on the same terms as the bulls, because the bulls have not been altogether a success. It is no use either compelling a man who travels a horse to take a licence if you allow those to escape who keep their stallions in paddocks and take in a few mares. The trouble is that there are too many mongrels, and a farmer will not pay £2 for a good horse if he can get one for 10s. or £1. About twenty years ago, when very few people kept stallions for their own use, there was a better class of draught horse in the colony, and if there was a small tax on stallions it would do away with many of the inferior horses. The tax must be levied on all stallions, however, whether they travel or not.

Mr. J. POTTER (Cherry Gardens): I am opposed to a tax. I am always down on taxes of any kind. The reader of the paper has referred to mongrels, but it would be easy to do away with them if farmers would only support the man who had a good animal. There was a man in our district with a horse about 4ft. high. We do not want horses like that, because we can always get plenty of ponies if we want them.

Mr. W. R. WHITAKER (Port Broughton): I think Mr. Hawkes' idea is a good one, and one that will get over the difficulty. The members of a Bureau when they got a stallion would see that he did not get too much work. The great difficulty about a tax is the man who has a stallion on his place and does not travel him. You could not tax him, and the neighbors would continue to patronise his mongrels. Something has been said about the bulls being failures, but they have been a great benefit in many districts, and you can see a marked

improvement in the stock where they are. Our Branch bought a bull of their own, and that bull and the Government beast are doing wonders in getting a better class of cattle. If a horse does not get foals, it is often the fault of the farmers as well as the owners. I have kept stallions, and I got as many mares as I could. I have had 100 mares to one horse, and it did not trouble me whether a farmer got foals or not—it is all a question of money. But it a bad practice to work a stallion too hard, because the next season you will find him worked out.

Mr. D. F. KENNEDY (Kadina): I notice not only at this Conference but at the Branch meetings the speakers invariably start with the word "mongrels." I would like to know what it means. We often use the word when we should not. I am thoroughly opposed to the taxation of stallions. Some of the best horses I ever had in my life I got from stallions that some people would call mongrels. The fact is you cannot tell how they are going to turn out. I had a pure-bred Jersey bull for five years; offered the use of him for the Branch, but never got a cow for him. I only got five cows brought to him in the five years, and those belonged to outsiders.

A VOICE: What did you charge for service?

Mr. KENNEDY: Five shillings.

Mr. J. G. JAENSCH (Murray Bridge): I am opposed to unnecessary taxation or to Government aid where it is not reasonable, but I would agree to having an expert sent out to examine stallions and a fee charged to cover the expense. Then he could tell us which were the mongrels and which were good horses. I keep a stallion, and I would be glad to pay an expert to examine him and say if he is good enough for public service. I do not think the Government has any right to buy stallions with the taxpayers' money and interfere with owners of stallions, unless they hired them out to pay interest on the cost. If I was sure of getting a good horse I would be glad to hire one from the Government.

Mr. W. E. FISHER (Tatiara): I believe the majority of the Bureaus are in favor of the Department assisting them to purchase bulls by means of a subsidy on amounts raised. The old way of loaning the bulls does not work well because it causes jealousy. We are going to have a bull of our own, and two of our members are deputed to purchase one before leaving Adelaide. If the Government are not, as some said, to interfere with private enterprise, then we had better shut up the Export Department and the State Bank.

The CHAIRMAN: Do not leave the subject altogether.

Mr. FISHER: If we adopt a good deal that Mr. Hawke has suggested the farmers will be sure to benefit. If an expert is appointed, the tax should not exceed £5.

The GENERAL SECRETARY: I think we do not require a tax so much as a kind of licence. It is the opinion of the majority of Branches that the Government should be asked to see that the stallions are sound and fit horses for farmers' purposes. It would be unfair to the taxpayers generally if an expert was provided at the expense of the State, and therefore a fee should be charged to defray the cost of the examination. The term "tax" has been misapplied. It should be "licence."

Mr. H. KILLMIER (Tatiara): I think Mr. Molineux has put the matter very fairly, but the licence should apply to all stallions, whether travelling for hire or not. I claim to have the best horse travelling in our district, but my trouble is to get people to believe it, because others claim the same thing, and we want someone who knows more than we do to tell us which is right.

Mr. W. TILLER (Meningie): I am entirely opposed to the tax, because I do not think it would improve the class of horses we should get. I would support it if I thought it would, because people take far less care with horses than

other stock. I know one man who has spent thousands of pounds in improving the breeds of cattle, and he told me he had been asked £110 for a pony in Victoria but thought it was too much. He asked them for a cheaper one, and they sent him one at 9 guineas, which he has turned into a mob of brood mares. A tax would have no effect on him.

MR. JØRGENSEN (Mount Remarkable): I propose that this Conference agrees with Mr. Hawke's paper and with the remarks of the General Secretary. If a private individual likes to keep a stallion for his own use I do not see why he should pay a licence fee. If he travels for money he should pay, but why should we interfere with him if he likes to breed mongrels for himself. I travelled an entire for some years, and I believe the reason why so many mares fail to get in foal is because people force the mares; it is chiefly done by the man who owns the entire. The mare should be allowed to wait until it is her proper time and not forced.

MR. JAENSCH: The trouble is to get people to reject the mongrels and take the good horses; but if the horses were examined by experts it would make all the difference. I would like to see the mares examined also if the owners care to pay for it. I would be very glad to pay an expert from Adelaide to go through my horses and tell me which are good ones.

MR. LEHMANN (Murray Bridge): I favor an examination and a licence fee for stallions. It is very difficult to get hold of a good brood mare nowadays, and the reason is that there are so many inferior stallions.

MR. SHIPWAY (Koolunga): If the Bureaus hire stallions they can be sure of getting good ones, and that they do not cover too many mares. I do not agree with the proposal for a Government subsidy. I would rather pay a little extra myself than have an outsider who has no interest in agriculture say "I have to help to pay to keep you going."

MR. SISSONS: We have heard a great deal about a Government expert, but how would an expert define a proper and suitable horse for travelling a district? All he could do would be to examine a horse and say if it was sound, and had no sidebones or ringbones, and so on. Without the pedigree he would not know whether the horse is a mongrel or not. The pedigree is of more importance than what you see in the horse, because animals will often breed back a long way. It is indiscriminate crossing that makes the mongrel.

MR. A. L. McEWIN (Brinkworth): If we prevent the mongrels from travelling we shall put a monopoly in the hands of the few men who have really good entires. In our district there are some first-class stallions and some which are inferior in appearance, and I have often seen the best stock got by the latter kind. My idea is that a good deal depends on what goes down the throat. If a horse of inferior appearance is well fed and cared for, you can often get as much out of him as out of a horse with a good many fine points about him and that you would have to pay £30 or £40 for. The members of the Bureaus can buy their own horses; let us keep away from the Government. We do not want help from the Government to run our farms.

THE CHAIRMAN: There are many other points in this paper that have not been touched on besides that of the stallions.

MR. C. GOODE (Gladstone): I do not agree with having a licence fee. A farmer knows what sort of an animal he wants, and if the expert condemns the class of stallion he has been using he will have to buy one for himself, because the one he wants will not be allowed to travel. There are generally horsey men in a district who will tell a farmer what a horse is.

THE GENERAL SECRETARY: Most horsey men travel stallions themselves.

MR. GOODE: What if they do? It is not right that if I want to use a stallion an expert should be able to condemn him and say I must not. It is not always the Clydesdale horses and the best bred ones that are the best for farm purposes. Some think the lighter horses stand the work better.

Mr. H. ALDENHOVEN (Woolundunga): If the licence-fee is imposed it must be on all stallions, and not only those who travel. In my district they are nearly all kept in paddocks, because the owners, as a rule, have a great many mares of their own, and only take in a few others.

Mr. J. SANDOW (Koolunga): The stallions have come in for a great deal of blame, but if a man takes care of his mares they will usually get in foal. Very often they are allowed to run in a paddock with a colt that has not been castrated, and he is always worrying them. I am opposed to taxation in this matter, but men travelling stallions should have certificates showing that the horses are sound and in good health.

The CHAIRMAN: Is not that a licence?

Mr. SANDOW: But not a tax. Members of the Bureau should stand by one another. There is a member of our Branch who had a good horse, and all the other members should patronise him. One of our members proposed that the Branch should purchase a horse, but I would not like to take the risk of keeping it and looking after it. It would mean being responsible in case of damage.

Mr. R. GIBBONS (Cherry Gardens): I second Mr. Jorgensen's motion. Something ought to have been done in the matter of a licence years ago.

Mr. ANDERSON (Port Lincoln): I am opposed to the motion entirely.

The motion was amended and carried in the following form:—"That this Congress of the Agricultural Bureau is of opinion that it is desirable that a licence-fee should be charged on all entire horses travelling for hire; such licence to be granted only to such entires after an examination by a competent veterinary surgeon."

Economising Labor on the Farm.

Mr. J. W. DALL read the following paper:—

In speaking of the economy of labor I do not wish to give the impression that I advocate the employing of as little labor as possible. No. I think this is an evil that has given rise to much that is unprofitable to the farmer and to the country at large. What I really mean is the importance of doing everything to advantage, so as to get the most good out of the labor expended without increasing the toil. In order to do this there must be judgment and forethought, as it is quite possible to do a great deal of hard work with main strength and foolishness.

The idea of doing the best work with the least labor is no new thought. That wise man, Solomon, many hundreds of years ago gave a hint on this subject when he said—"If the iron be blunt, and he do not whet the edge, then he must put to more strength, but wisdom is profitable to direct." Though old, this teaching is as real to-day as ever, and did we carry it into practice in an all-round way we should do better work than we often do, not only with the edged tools, but with the plough and the various implements we use in the cultivation of the soil.

The ploughshare is a very important part of the plough, and where an old blunt share is used the work is not being done to advantage, and where the land had been badly ploughed previously there is no economy in working a blunt share, as the very soil you want to break up is slidden over and the evil of bad ploughing is repeated. From the plough we may go to the reaper or mower, and the same truth holds good. If we could see where we pay for new machines in the loss of produce, without getting them, we would strain a point to have the pleasure, as well as the profit, out of the use of good implements and machinery and tools generally.

The loss of half an inch of hay over a field means a great many bags of good heavy chaff lost, or it may be in a large paddock many tons; and we should remember that this holds good in the production and gathering of all crops to a greater or lesser extent, according to the nature and value of the produce.

But there is economy needed in the protection of our produce as well as its production. Have any of us built large stacks of hay and then for the want of a little labor in thatching them had to spend a lot of strength in cutting down through damaged hay with a bad or blunt knife, when tired with the day's work, to get at the good hay for the working horses or stock and condemned our own neglect, as shown by the wasted hay, four or five times the cost of thatch, which should have been put on at the proper time? Depend upon it it is economy to thatch.

This subject of economy in labor is so far-reaching that it seems hard to touch on the

many important questions; but I want to call attention to a few matters which are causing continual disappointment and loss in the want of economy in the work of cultivation. I will record my thoughts on what I noticed in a twenty miles ride at seeding time, as it will make clear something of what I mean by economy in work of this kind.

The first want of economy was a farmer casting his seed on fallowed land that had not been worked; after the seed cart followed a fairly strong team and set of ordinary harrows, the weeds already up and showing in large patches on his finished work. The next paddock, owned by another farmer, appeared to have been treated in the same way. I thought what a pity that a man should have done good work in the fallowing and then, for the want of scarifier, should risk the loss of his labor. Next I saw a plough at work on land that for a long time had failed to produce a crop, and still another failure must be courted. On I went again, and saw a farmer who had a scarifier, but was dragging it through land that had not been ploughed for some time with the idea of getting the rubbish to spring, but it was high time the seed was springing for the crop, and I thought again, "Work done badly and at the wrong time must mean want of economy." A few miles further I passed a farm where the land appeared to have been fallowed and worked and the scarifier going before the seed drill, and I came to the conclusion here is economy. Economy seems to be—Do well what you do, and on the strength of the little well done do more. In doing the work it is quite possible to do it to the best advantage, and one way among many where we may gain is trying to do the best with the strength we have in the teams. How often we see a number of horses worked down through the seeding and at the end turned out to lose what little strength they have left, while the man who should be working them is putting up fences or attending to other needful work which should be done by some other person instead of the team being stopped for that cause. Shall we see how this works out in order to find if we can afford it? for this, after all, is the question. To begin with, the team is better if fed and kept at work than trying to get a living where it is not to be found, and the feed saved is more than lost in the weakened state of the horses; so we will take the value of the work the team could have done as a guide to find out where the absence of economy comes in. A five-horse team with a suitable plough should work, say, twenty acres a week at fallowing time. This is worth at least £4. An extra man could be got, to save stopping the team, to do the fencing or other work by the week or piece at, say, £1 10s.—loss £2 10s.; so that we may fairly claim it to be economy to employ extra help for a few weeks. Again, economy means placing our forces so as to avoid a loss in going over the ground twice where once would do. We cannot particularise here, but depend on it the old advice is good—see that you make every stroke tell.

Economy in the preparing of seed wheat is a matter that is not to be given up yet, and we are reminded of this fact year after year. If one quarter of a bushel is enough, as we have proof that it is if properly thrashed and sown, why do we continually use two or three times and up to five times as much when it is not needed? Would it not be wise to make some experiments on this matter, and see if there cannot be something done that will save the great loss that goes on so continually? Someone may say, "Where can it be improved?" And I answer, "In the thrashing and selection." Would it not be a good trial to cut and bind a few sheaves of wheat, as near the proper time as possible, and lash them over a log so that the best and only the best grains are thrashed out and then clean well, and at seeding time sow this by other wheat treated in the general way, and find out if it is an improvement or not? If we can make fifty bags of wheat go as far as one hundred, we should not only economise the wheat, but the handling also.

The employing of labor is a matter that is very perplexing to some, and the cautious way it is dealt with shows the want of economy in a very marked way; indeed, there seems on the part of some a disposition to lose a great deal rather than employ. This is noticeable in the case of some farmers who try to do everything themselves, and to save a few weeks' wages the work of the farm is allowed to get behind right through the year. This shows itself in the unfinished field of fallow, or in the stumps, pulled up by the plough at seeding-time, lying in the ripe corn and having to be thrown back by the man on the stripper at harvest-time; or taking his pocket-knife to cut high bushes amongst the crop to save choking his machine, and a host of other things that were needful but could not be attended to at the right time. This matter is more difficult than may appear from some standpoints. The producer cannot pay high wages, as he gets so little for his produce, and to help in this he has often to take the man or men into his own home. In some cases this is a difficulty that he does not see his way through, and so endures the loss rather than disturb his home and family. This may be quite commendable, but could it not be got over by erecting a cottage and room where a man could go and be comfortable in his own way and the employer saved the discomfort of his? If we looked all around this question we should find there is a more excellent way than the one in vogue at present, and in the end we should find it meant economy. Economy in stock also needs some attention if we are to make the best of our farms, as every horse kept that does not give a

fair equivalent for his feed is a loss. The same holds good to the farm stock all round—the poor cow milked for a small return, the low-class sheep that gives a light fleece, the poultry that do not answer the end for which they are kept. In all these things we must study economy if we are to have the best results, and why not? If the farmer has a right, as I hold he has, to expect some of the comforts and prosperity of his calling, shall he not find out the best means to make this good his own by the use of the powers he has in himself and that are within his reach?

THE GENERAL SECRETARY: In discussing this paper I trust members will avoid all reference to thatching and haycutting, because these can be discussed this afternoon, when the paper on "Hay and Haymaking" is dealt with.

MR. D. F. KENNEDY (Kadina): This is an excellent paper, and we should take it home and study it well. It is the best paper I have ever heard read at a Bureau meeting.

MR. R. KELLY (Renmark): While I can indorse most that is in the paper, there is room for remark on the point about leaving horses idle. A little rest does not do horses any harm, and can be made up for to some extent. In working on the farm I have used many kinds of ploughs, from the little walking plough to the 16in. sulky plough. That has been called the lazy man's plough, but it is nothing of the kind. Three fairly good horses will work it, and you can plough three acres a day. Boys can work them if you have an older person to go around occasionally and keep them in order. Tramping after a plough soon wears a man out, and I contend the something that will save his strength and do equally good work is worth having. I believe in having a system on the farm, and at the beginning of a season each month's work should be planned out. If work is delayed a week or two later than it should be done it takes more labor and the same result is not attained. If you take care of your horses they will do good work. Keep your plough in good order and it will work easily and take a lot less pulling by your team; and it is the same in many other things, if a man will only put some thought into his operations.

MR. S. H. TRELOAR (Redhill): One of the most important points Mr. Dall has mentioned is the thrashing and selection of seed wheat. I have no experience with steam thrashers. Can anyone say if they are better or worse than the stripper as regards seed wheat?

MR. H. KELLY (Central Bureau): I have used a thrashing machine for many years, and for seed wheat I took out the iron beaters and put in wood and raised the concave. In that way the seed was not broken. We did the same with barley and the brewers never complained of broken grain. For thrashing with steam thrashing machines the pay is generally by the bushel, and so the man is bound to thrash as quickly as he can. He cannot spare the time to trouble much about broken grains.

MR. E. J. HARRIS (Millicent): Some of our members tried an experiment in this matter. They took portions of the same crop and hand-thrashed some and used a machine on another part of it. The grain was sown, and while of the hand thrashed 90 per cent. germinated and stood out well, of that thrashed by the ordinary steam thrasher which travelled the district only 37 per cent. came up. That clearly showed the superiority of the hand-thrashed grain for seed.

MR. J. B. ROWE (Arthurlton): We had a similar experiment, taking 100 grains each of hand-thrashed and stripper-thrashed wheat. The latter, as far as could be seen, were perfectly sound, the broken grains being rejected, but they only gave 70 per cent., as against 97 per cent. from the hand-thrashed wheat.

MR. J. BUTTON (Koolunga): The last speaker picked out only sound grains from the stripper, whereas in the other case mentioned they were taken as they came from the steam thrasher. That might make a lot of difference, because you can see many of the damaged grains.

Mr. T. DUNSFORD (Narridy): It seems to me that the wooden thrashers are the most practical for getting out of the difficulty. We cannot thrash by hand where we have a large area to sow. This is a very important matter, because it causes a great loss if you put a lot of wheat in and it does not grow. Mr. Dall's is a very good paper, but it must be admitted that most farmers are improving their methods so rapidly that they have not much to learn from it. It is, however, a model, and if a farmer can get near to what he advocates they will do very well. We are trying to reach the standards he has set up, and if we do not reach it in all respects it is chiefly because of want of means.

Mr. JORGENSEN (Mount Remarkable): A good farmer will not reap his wheat haphazard from all over a paddock, or at any time of the day. He will pick out the best of his crop for seed, and raise his beaters so as not to crack the grain. You should reap for seed on a nice warm day, and then it will clean easily. Most farmers employ one or two men all the year round, and when work is slack they should be set to do such work as fencing, and not leave it until all hands should be at work ploughing.

Mr. GEO. STONE (Port Germein): As to damaged wheat through steam thrashing, I have had several years' experience. I have sown and drilled wheat from the thrasher, stripper, and header, though I have not carried out exact experiments on a small scale. The result, as far as I could see, was about the same from each. In the thrasher, however, there is not nearly as much broken wheat as in the stripper. Last year I sowed half a bushel to the acre of wheat I thrashed a year previously, and it did splendidly. It was quite thick enough.

Mr. W. CORRELL (Minlaton): It is a good plan to reap seed wheat when the weather is cool, of course seeing that the machine is set properly so as not to break the grain. I have found it a good plan to put a piece of sheepskin in the stripper where the wheat strikes, and that saves a lot of breakage. I find that wheat grown on manured land is more liable to break, because it is more bulky than where fertilisers are not used.

Mr. G. TEAGLE (Kapunda): I always save my seed from the first reaping, as it is better for the purpose than that reaped later in the season. If you use good shifting screens and put it through twice there is very little risk of broken grains. I have used the stripper for the last forty years, and on the average I can get a germination of 90 per cent.

Mr. W. A. WORNUM (Gladstone): I think it might be better if farmers employed more labor than they do. A great many cannot afford now to employ labor, but if they adopted some of those industries that Mr. Molineux recommended in that very excellent book of his they could profitably find work for many more men.

The CHAIRMAN: What do you pay for labor?

Mr. WORNUM: The wages vary a good deal according to the position of the man who is seeking work. One of the members of the Gladstone Branch got a steam thrasher about two or three years ago and he finds it works very satisfactorily. I do not know if it injures wheat for seed, but it will not for milling purposes. There are several steam thrashers in the North and they bring about much economy of time and expense.

Mr. W. TOWILL (Bowhill): I only sow 25lbs. of wheat to the acre and anything more than that I find too much. Thick sowing is a great mistake on a lot of land in the colony. No doubt some of it requires much more seed than other parts, but I find that an average of 25lbs. produces the best crops.

The CHAIRMAN: I again ask what you can get labor for. My son tells me plenty of good men can be got at 8s. or 10s. a week.

Mr. JORGENSEN: That is a mistake. I always pay 15s. or £1.

Mr. McEWIN: If farmers would combine and agree to employ their men all the year round and pay a fair and uniform wage it would be a good thing. I try to keep two or three men continually and give them about 15s. or £1 a

week. The difficulty is that my neighbors do not always find continual work for their men, and at harvest time they pay 30s. a week, so that I have to do the same or the men will be discontented. The result is that when things are dull I have to cut down wages if I am to pay my way. It is a cut-throat system, and it would be better for both employers and men if a uniform rate could be arranged. As it is, just as a man is getting used to the farm and knows his way about you lose him, and you have all the disadvantages of changing men. As to the quantity of wheat to sow, it is no use laying down any fixed rule, as it varies according to the land. Some land will do with 30lbs. to the acre, while other places need 40lbs. to 60lbs. I believe more wheat is damaged though too much pickling than from any fault in the machines.

Mr. E. H. WARREN (Arden Vale): We have proved by experiment in our district that pickling does not injure the wheat, provided you do not use more than half a pound of bluestone to the bag. I knew a man who for a trial left the wheat in pickle for forty minutes and it grew well when sown.

Mr. J. G. JAENSCH (Murray Bridge): I have no trouble with my man. I have had him since he was eight years old, and I give him 12s. a week, except at ploughing and harvest time, when he gets £1. He knows better than I do what has to be done about the farm, and I have been away six weeks now and he is carrying the farm on. I have no family—(cries of "That makes a lot of difference.") I am not going to leave him the farm, if that is what you mean, and he does not expect it.

Mr. DALL: I very much appreciate what has been said about my paper. As to seed wheat, I was not prepared to meet such a variety of opinions, but I am satisfied that there is a more excellent way of dealing with it than has been generally adopted. An old Cornish practice is to thrash the wheat lightly over a log for seed, so as only to get the best grains. I do not know whether this is a good plan. At our Branch at Nantawarra we went into the question of the amount to sow pretty thoroughly. We counted the number of grains in 1lb. of wheat and we found that 7lbs. to the acre will put four grains on every square foot of land. If this is a fact, why sow 75lbs. to the acre, as some do. I put all my seed wheat over a Mellor's screen, and not only does this take out the broken wheat but the small hard grains. The latter no doubt would grow, but it is a question whether they are as good as the larger grains. I have a paddock of 200 acres sown with the selected seed, and it will more than bear comparison with paddocks sown with unscreened wheat. The crop is now looking beautiful. A neighbor of mine once persuaded me to try sowing a little thicker than usual; he said he had got better results with 35lbs. to the acre than with half a bushel, so I tried it. When this very man saw the crop up he remarked that it looked a little too thick. This matter of seed deserves some attention, and a few experiments in it would pay well. Some one said we could not thrash all our seed by hand. I never supposed so, but we could easily thrash 50bush. or 60bush. by hand. Suppose it even cost 6d. a bushel, this would be nothing compared to the loss we sustain by using broken grain which never germinates.

WEDNESDAY AFTERNOON SESSION.

Mr. WHITTAKER: I move that we fix a time limit of five minutes, and that each speaker be only allowed to speak once except to make an explanation, and then for not longer than one minute. We shall then be able to get through our work more quickly.

Mr. KELLY: I second that.

Mr. DALL: I move as an amendment that the time be two minutes. A good deal can be said in two minutes if it is said to the point.

The amendment was not seconded and the motion was carried.

The Growing and Management of Hay.

Mr. H. A. DAVIS (Riverton) read the following paper :—

In this paper I propose to give my own opinion on the growing and management of hay, based upon many years' experience. It must be nearly forty years ago when, as a boy on my father's farm, I commenced my experience in growing and chaffing hay. Then we worked an English make of chaffcutter by horsepower, and thought we had done a good day's work when we turned out three tons. Afterwards we enlarged operations and turned out eight to ten tons daily, and so have extended operations until at our mill at Riverton we use a 12½ h.p. oil engine to drive two of Bagshaw's No. 6 cutters, with screens, baggers and elevators, and can turn out twenty to twenty-five tons per day with greater ease than we did our three tons in the earlier days. From fifty to one hundred tons yearly in the sixties we have increased our output to over 5,000 tons during the season now closing. For the first thirty years we grew all the hay we chaffed, but of late I have bought as well as grown large quantities. I mention these facts to show that I know something of the practical work connected with hay.

Growing Hay.

The time has gone when any crop will do for hay. In order to grow good hay which will meet with ready sale it is just as necessary to prepare and work the land as for a wheat crop, in fact even more so, as many of the weeds, such as cockspur, native cabbage, and others, which the stripper will pass over and will not damage the wheat sample, would be all gathered up by the binder and greatly deteriorate the value of the hay, whether for the market or for one's own feeding. A large number of farmers cut their lightest and poorest crops for hay. This is a mistake, as often a crop that would only return half a ton of hay per acre would yield 10 bush. of wheat, whereas a crop that would yield 16 bush. of wheat will often return 30 cwt. to 2 tons of hay per acre. It will be at once seen that the heavier crop would pay much better for hay and be much better quality and the lighter one for wheat. Again, there is not so much risk, as in the case of rough weather the loss would be far worse on the heavy crop than on the light one.

The land for a hay crop should be fallowed and worked thoroughly through the year, and care should be taken to have as few furrows and ridges in the field as possible, so that it will be level. It has been my custom for a long time to have two crops of hay in succession. This I have done very successfully, more especially since adopting the drill and manures. I fallow a paddock, crop it, and cut it for hay early, in a good green color, so that any oats which may be in the crop may be taken off before they fall out; I then scarify the land well as soon as possible after harvest and work it down fine, then scarify and drill the seed in early with, say, 70 lbs. to 80 lbs. of English super. or 100 lbs. of guano or Thomas phosphate; with all of which I have had good results. In this way I have often had a better crop the second year, and as good the third year, as from the first crop when fallowed. I very much prefer the scarifier to the plough when cropping the land a second year, as it leaves a better bottom for the binder, and the crop seems to come along well. I find it stands the dry hot winds of September far better than the ploughed land, and is much better for the machines to travel over. This applies even more to the small hay growers, or those who cut for their own use only and use the mower and horse rake, as, with scarified bottom, the hay can be got together with little or no dirt in it—a very great advantage, and one worth noting. These remarks apply to our loose black, or limestone land. I am not prepared to say how they would work on the more sodden, or clay soils.

The Best Wheat to Grow.

It is difficult to say which is the best variety of wheat to sow, as we are not always sure that the crop will be cut for hay. I have tried nearly every variety, and I think the best all-round wheat is a good Purple Straw. It is certainly one of the best varieties for wheat and makes a first-class hay, as it stools well, has a good flag, holds together well in the sheaf, will allow the grain to get on well towards maturity, and yet will retain a very good color, which is not the case with white straw wheats. If you want color with the latter they must be cut green, before the grain has more than formed. There are many other good varieties, such as Tuscan, Defiance, Scotch Wonder, and Leak's. In the south and later districts the Tuscan may be said to be the best, but with us and further north in most seasons it is too late, and in three years out of four years suffers more or less from hot winds.

If the land is dirty with wild oats I would advise sowing Early Para, King's Early, or Dark African. These are all very good, quick-growing, early varieties, more especially the latter. They will come along and be ready to cut with the wild or black oats, which is not the case with any of the first-named varieties; but I do not care about these on clean land. The Early Para is a very light and slippery straw, having little or no flag, is

very hard to bind securely; the Dark African is better, but neither weighs well for hay; the King's Early would, I think, make a good hay wheat. But I do not much like the bearded varieties, as I am afraid horses fed on this hay would suffer very much from sore mouths, unless they had special attention. Were it not for this, I think it would be the best of the early varieties, as it grows well, stools fairly well, and weighs better than any other variety I have seen, but like the Para, does not bind well, being very stiff in the straw, and does not seem to yield to the compressor, consequently the strings slip, making it very bad for handling.

Sowing.

I like to sow thickly for a hay crop, early varieties not less than 1½bush. to 1½bush., or if anything a little more, as they do not stool, and if not sown thickly cannot yield a good return; the later varieties 1bush. to 1½bush. per acre if sown broadcast, and I would not put less than a bushel on with the drill, but for a portion of the hay crop I would prefer to drill the manure in early, say March or April, and then sow the seed broadcast in May, or when the time comes. I am quite sure that from 5cwt. to 8cwt. of hay more per acre can be produced in this way than when sown in drills, and it is much easier for the binder to cut, as in driving a binder when crossing the drill rows it labors very much in a heavy crop, and if you are not used to it you would think your machine was going to pieces. In any case it is worth a trial, as it would produce as much crop. It would be a great advantage to have some of your manure on the land, so that if we got a very wet spell of weather we could go on in the old style till it cleared again. This, I think, would apply to wheat or hay crops, but for hay I prefer it, more especially with bonedust, which should be put on the land as early as possible. I would not advise doing too much this way with the more soluble manures, such as English super, super guano, &c., as if a heavy fall of rain came soon after the manures might be taken down into the soil and the young plant not get the benefit of it in the early part of the season. Having sown or drilled the crop in, it should be well harrowed with light harrows, leaving as small marks or furrows as possible. Great care should be taken that the harrows are kept clean, and not allowed to drag in any way. All stones and sticks should be cleared off and the field well rolled as soon as the plant is well above ground, and before the land sets so that the roller cannot make an impression on any ridges that may have been left by the harrows. If this is neglected great loss must follow, as the binder must be set to run at least an inch above these ridges, which will mean 2in. to 2½in. of stubble in the furrows; and if we only knew what this meant in a crop of 300 acres or 400 acres we would pay far more attention to such seemingly small matters than is usual. I have seen on hundreds of acres from 5in. to 6in. of the very best of the hay left on the field through the farmer neglecting attention to the above. This is not only waste, but becomes a great hindrance to the farmer in the use of his implements on the land if he requires to crop the following year.

Harvesting.

Without a doubt the very best way to harvest a hay crop is to use a good twine binder, and any farmer who has any quantity of hay to cut, if only for his own use, should use one, as the hay is better in every way. There is no dirt or dust in it, if well stooked it will not damage in wet weather, it cleans the land, it saves time and labor in handling. Two men and a boy with a wagon, if used to their work, will cart and stack in the paddock 15 tons to 20 tons per day. One very important point, but one which is often overlooked and neglected, is to have all your machinery ready and in good order for a start before the crop is ready. The binder should be thoroughly overhauled every year, and if you do not understand the machine thoroughly you will save money and time by getting someone who does to go over it for you and see that everything is in good repair. A few shillings spent in this way is money well spent, and will save valuable time on the harvest field. It will be found a great help if, at the close of the season's work, you go over the machines with those who have driven them and take a note of any part that has not been working satisfactorily. It is also wise to keep by you a few of the small parts which sometimes fail, such as a spare pitman or driving rod, a knife head, a knoter and retainer pinion, drive dog, dog spring, &c. I have known a farmer lose two days' work through the breaking of the last named, which only costs 6d. or 9d., and he declared to me that he lost £10 on his crop, besides wages to harvest hands.

The Time to Cut.

Opinions differ as to the best stage to cut a crop for hay, and a good deal depends on the crop, what it is intended for, whether for market or for use, the quantity the farmer has to handle, and the strength he has to do the work. If for market, and the farmer has a lot of hay to cut, it is as well to begin as soon as the first portion of the crop is ready, which is when the wheat, or the greater portion of it, has stopped growing; this can be ascertained by taking the head in the thumb and finger; if it leaves the last knot readily and is soft and sappy, it is still growing, but if it resists and when pulled out is firm, the

crop has done growing and a start may be made. The first portion of the cutting will then be of a beautiful green color, but with very little grain; but as you get through the field the grain will be maturing, and at the end of say 200 or 300 acres you will have a full grain but very little color; but if in carting you mix the whole together in the stack you have hay that will make a prime sample of chaff, with a fair amount of grain and a good color, that will command the highest market price. Cutting a small quantity for one's own use the crop may be allowed to stand longer, say until the second blossom is off when the grain is beginning to form, and the straw and bottom flag dying off or showing a white appearance. This is the stage when the hay will have the most sugar, and on the whole will be at its best.

In a dirty crop one has to be guided by the oats. If an early wheat has been sown the above remarks will apply, but if a late wheat, the oats must be cut when ready, at the sacrifice of the other portion of the crop.

Stooking.

I like to stook almost immediately after the binder, as I find it the best way in our dry districts, and to make good round stooks, more especially if the hay is likely to remain on the land for any length of time, as they do not dry so much as the long narrow stook, and are not so easily blown down. They are also easier and more quickly put up. A little judgment should be used in this, as if the crop is oaty and the hay very green—with the weather cold and damp—the stooks must not be made too large, or they will go off color in the centre; but if it is good, coarse, wheaten hay, and the weather is hot, it may be stoked directly after the binder, and in fairly large stooks.

When and How to Stack.

Hay should be got into the stack as quickly as possible after it is fit for carting. Hay comes out of the stack in much the same condition as it goes in. If it is allowed to lay on the field till every bit of sap is dried out of it, and in this parched condition it is put into the stack in dry weather, it will come out in the same condition, no matter if it is in the middle of winter, and it cannot be got into a good condition for chaffing, but will split and be dusty unless saturated with water, and then the chaff will not keep. I believe it would pay every farmer to stack his hay promptly in the paddock instead of carting it say three, five, or seven miles to the chaff merchant, who, if he knows his business, will not take the hay until it is quite dry, so that it will not shrink in the stack and lose weight. If, instead of the farmer getting all his hay in the stack in a few days, it is left on the field for a week or two, and then in many cases it takes four or five weeks to get it carted to the chaff merchant, it means great loss to him and also to the quality of the hay. We come now to the very important point—

Stacking and Stack-building.

It is important that the best position possible be chosen for the stack, being high and dry, and, above all, easy to get away from. I have seen stacks built in positions from which it would be impossible to remove them during say six months of the year. The stack should be set out with its end facing the west, as in this way you only expose 7yds. to 8yds. to the weather, instead of 20yds. to 40yds. if built side on. Take care not to make the stack too large, better have a few loads to spare than be short and have to make a squab instead of a stack. 20yds. x 7yds. x 7yds. should hold 100 tons. I prefer, say 17yds. x 8yds. x 7yds., which will hold also about 100 tons, as the wider stack is easier to build, as you have not so much outside. It is very necessary to put a good layer of straw or wheat chaff, or, better still, a layer of sheaved wheat straw at the bottom of the stack. If this is not done the first layer of sheaves will be more or less damaged and spoil the sample of many tons of chaff. I find the easiest, quickest and best way to build is to lay with a fork, laying all the butts outwards, placing the second butt on the strings of the first one, and so on right through the stack. Do not pack the two outside rows too tightly, or at any rate not much tighter than you lay the middle of the stack. I have seen builders pack and even knee the two outside rows and then throw in the middle of the stack anyhow with a fork, the result being that as the stack settles the middle becomes the lowest, with the result that it will take in all the rain that falls; but if the middle and sides are equally packed and the inside rows are kept a little higher, very little rain will go into the stack should any fall before it is thatched. It is also necessary to see that the stack is allowed to grow or expand a little, more especially the last three or four rows, before beginning to roof, so that as the water runs from the roof it will drop clear of the sides of the stack when thatched.

Thatching.

This should always be done, and done well, as early as possible, unless you are quite sure that the stack will be removed within the first three months of the year. This is a most important point, and one which is very much neglected by many farmers and even

hay merchants themselves. I have seen farmers, and not a few, who have grown a heavy crop of good hay, paid £50 to £60 for a binder to cut it, paid for string and expenses of carting and stacking, a total cost besides growing the hay of £100 or over, and then left the stack to all winds and weather, with the result that fully one-half of the hay has been thrown away, and the balance has caused no end of trouble between the farmer and the hay buyer, and again the chaff merchant and his customers. Now I venture to say that the stack could have been secured with a good coat of thatch, so that not a sheaf would have been wasted, at a cost of from £4 to £6, valuing the straw at £1 per ton. I am pleased to say that in many cases farmers are seeing the folly of this, and many of them are thatching their stacks, but many are still satisfied with putting a few loads of straw on the stack, which is a very poor substitute for good thatch, and is often taken off by the wind.

In conclusion, I would like to emphasise my remarks. To grow hay successfully, work your land well, grow nothing but good hay, attend strictly to details, have all your machinery in good order, waiting for your crop, see that you do not spoil everything by a penny-wise and pound-foolish policy in neglecting to protect your hay when stacked. Let your motto be—"What is worth doing is worth doing well."

Mr. JORGENSEN: Do not you find the sheaves get black or mouldy in the stack when you cart them before they are dry?

Mr. DAVIS: Most certainly, if they are carted too soon, but a very little judgment will show the proper time. You should go to a fairly large stook and pull out a handful from the centre of a sheaf and see if the sap has gone out of it. If the bottom knot is green it is not ripe, and if the hay will stand twisting up it is not fit for carting. If, however, it breaks when you twist it there will be no trouble.

Mr. DALL: We cannot attach too much importance to the proper preservation of hay. A good many seem to think that a ton of hay reaped anyhow is as good as anything else, but the worst thing a farmer can do is to stack hay carelessly. I have not found anything in the paper to criticise except the remark about early carting. I have found it all-important to have hay properly dried before stacking it. Some years ago two of my brothers had a heavy crop and wanted to get it into a stack quickly. I cautioned them, but they said they were only putting two loads a day on the stack, and it would be all right. The result was that the stack had to be pulled down. To find out if hay is ready for stacking it is a good plan to strike a knot in the straw with a hammer. If there is sap enough to spurt out, be very careful; it is not ready.

Mr. G. ROBERTSON (Wandearah): Has Mr. Davis had any experience in chaffing Algerian oaten hay. I had some, and it did well and grew splendidly—the finest bit of hay in the country. It was a splendid color, but the horses did not care for it?

Mr. DAVIS: That last remark explains the whole thing; with Algerian oats you must sacrifice color if you want good hay. Do not cut it too early, and do not mind if the oats are well grown, the horses will get more benefit out of the grain than the straw. With Champion and other oats it does not matter so much, but it is different with Algerian.

Mr. WORNUM: I have been growing Algerian oats, and I find horses like them better than wheaten hay. King's Early in our district is recognised as the leading bearded wheat for hay. There are three large chaff mills there, and this variety is grown more than any other. It is bearded, but not heavily, and I do not think the chaff does the horses any harm.

The GENERAL SECRETARY: As a provision of food against seasons of drought, a plant which is not generally recognised as useful is the Tamarisk. I have seen it growing under nearly all kinds of circumstances. I have seen it growing in clay soils, light black soils, in sand, and even in the sea—the latter at Fletcher's slip, where the roots were in the sea always at high tide. You can grow it from cuttings, and you can cut it about as much as you like. I am surprised that it is not more cultivated as a wind break and for fodder. A remark was made yesterday that if wheat be cut in the dough stage the nutriment must be in the straw; but the fact is that if you stand wheat in the field after

being cut the grain fills out and ripens. That is well known in connection with red rust. Wheat can be saved from rust by cutting it at the dough stage, and it ripens in the paddock.

Mr. JAENSCH: I have always been of the opinion that hay is more digestible by horses when it has turned than when it is green. Grass is best for stock when it is dry, and Algerian oats are, as a food, best when rather dry.

Mr. DAVIS: In the color of hay we must consider our customers. If it is not green they conclude that there must be a lot of straw in it. I believe that hay well matured, and with the grain forming in it, is the best for horses, but we must be guided a good deal by the animals themselves. Probably, as a rule, they would take better to green hay, but then we must remember that the foods we like the best are not always the best for our digestive organs. For the markets of Broken Hill and Sydney and even Adelaide we want the green stuff. There was a time when we could send the light hay to Adelaide and export the other, but all that is changed now.

Mr. JAENSCH: For the market the green hay may be the best, because the consumer can see it is fresh and not mixed with straw, but we should not go by that in preparing hay for our own use.

Mr. G. TEAGLE (Kapunda): I sowed three kinds of wheat, King's Early, Gray's Early, and White Tuscan in the same paddock, and when I put sheep in they ate down the Gray's Early close to the ground, leaving the others standing like walls on either side of it. I have tried experiments for ten years, and I find Gray's Early and White Tuscan the best for hay. Gray's is a very early wheat; it may be the last sown and still ready in time for hay, in fact it is as early as the oats.

Mr. J. SMITH (Hawker): The paper is evidently accurate, because no one who has spoken is able to criticise it. In our district we have been receivers of chaff rather than growers of hay for some time, and we look for a green color now because we can tell by that that there is no straw in it. If it is not green the people tell us it has straw in it.

A VOICE: So it has.

Mr. SMITH: No doubt, often. I hope farmers will profit by the advice Mr. Davis has given, and if he has got some of that nice chaff he talks about I shall be writing to him. In the past, when buying hay, what we have often received has been a mixture of oats, grass, and straw.

The GENERAL SECRETARY: Mr. R. Marshall is here, but as he is not a member he does not care to speak without an invitation. I would ask him to say a few words about his famous solid straw wheats.

Mr. R. MARSHALL: In solid straw wheats I have now something like thirty varieties, mostly beardless, and we find cattle prefer them to the hollow straws. The reason is that they contain more saccharine matter and are correspondingly easier of digestion. They do not contain so much fibre and are better for hay. I have not been on the farm for two years, but my sons inform me that the horses are stronger and work better on it than on the other sorts. It is only during the last two or three years that we have had any large quantity of the solid straw wheats. On the average a sheaf of solid straw wheat will be several pounds heavier than a similar wheat of hollow straw. We are continually making new varieties by cross-breeding. We have one as early as the Early Para and we may yet get them earlier. You never know what you are going to get by cross-breeding. By crossing an early wheat with a late one you may get an exceptionally early variety.

Mr. KELLY: Since I have resided in town and had to buy chaff I have found that a lot of the stuff is simply scandalous. I have found bag after bag with lumps in it as large as a hat, caused by putting water in it. In my early days we grew White Tuscan at Mount Barker, and as soon as the cattle heard

the thrashing machine going they always rushed up for a feed of the straw. If you use the thrashing machine and the binder you will find your cattle will eat every bit of the straw.

Mr. JORGENSEN: There is a difference between sowing for the market and for one's own use. The writer of the paper has studied the market chiefly. If you cut hay too green it loses in strength and weight, whereas if you let it stand a week or nine days longer you get a much better crop. A horse will eat double the quantity of green hay than he will if it has been allowed to stand until the grain is in it, because there is not the same amount of nourishment while it is green. So the farmers lose both ways by the green hay, though it is of course better for the merchants, because, being a good color, it sells readily. Hay cut very green should not be put in stooks directly it is cut. I tried it one year and it was a failure, as all the inside sheaves that were not black turned white. It is well to turn them singly on the ground till they dry properly before stooking them, and then you will have a nice marketable hay.

Mr. G. ROBERTSON: If one field is allowed to get a little bit too ripe and another adjoining is cut in the green stage which would weigh the heavier?

Mr. DAVIS: I should think the heavier would be the more mature crop if it was a good season and there was plenty of sap rising for the grain to feed on. For instance, if you have a 20bush. crop you have something like 12cwts. to the acre in the heads alone and you have the straw left, which will weigh nearly as much as the whole plant cut for hay a little earlier.

Mr. WARREN: I would like to have the opinion of the meeting as to which is the strongest and most nutritious food for horses—hay cut green or well matured.

Mr. DAVIS: That is a very difficult question to answer. Sometimes I think one is and sometimes the other. I believe, on the whole, hay has most sugar in it and is better for all concerned when the head is just forming.

Mr. W. C. GRASBY (Central Bureau): Professor Lowrie answered that question in his "Farm Notes" in the *Journal of Agriculture* in November, 1897, and as it has been raised several times during this Congress it is perhaps as well that his notes, bearing as they do distinctly on this subject, should be quoted. In October, 1894, he said in the *Garden and Field*:—

Many farmers delay cutting until the grain is well formed. This is undoubtedly a mistake, for what is gained in the grain is lost, and more than lost, in the stem and flag. For a few days after the crop has bloomed the elaboration of nutritive materials may go on, but when the grain begins to form it practically stops, and the changes which take place in the plant are merely a transference of nutritive materials from the stem and flag to the grain. Further the cellulose envelopes of the cells of the plant, which, when the crop is cut at the right stage are more or less digestible and nutritive, become, in proportion to the delay in cutting, woody and indigestible. Hay should be saved as early as possible so as to admit of a *very slight* fermentation or heating when placed in the stack.

I remember very distinctly having a conversation with him in 1894 on that point. It is one of the highest testimonials to his value as an experimentalist that he is not afraid to admit having changed his opinions when he has due ground for doing so. Accordingly in the *Journal of Agriculture* for November, 1897, page 360, he said:—

The stage of ripeness at which to cut cereal hay is by no means well defined. The market certainly likes good colors, but I am inclined to the belief, and that the more as I gain experience of cereal hay, that the South Australian consumer errs in requiring too much color. Certainly, there is less possibility for the adulteration of the chaff with headed straw or ordinary straw; but every consumer ought to know that there are other means of discovering this than by the degree of color. Farmers who make grass, clover, or trefoil hay, rightly I think, follow the practice of cutting shortly after the crop has bloomed. The trend of the teaching of physiological chemistry is to the effect that what is gained in the grain from the time it has begun to form is lost in the nutritive value of the flag and the straw. That the elaboration of the nutritive material in the plant almost stops after the seed has begun to form, and the energies of the plant take the form of the transference of the nutritive material already

present in the cells of the leaf and stem of the plant to the grain, to be there stored up. The straw, it is held, becomes more woody and less digestible. However, I am not aware that exact feeding-tests have been made with cereal hay cut at different stages of ripeness, and I am inclined to the belief that for this class of hay an exception to the general rule has to be followed, and I would certainly say, in the absence of such exact tests, that every day working experience seems to point out that the cereal hay cut at that stage at which it will yield a fair grain in the chaff—a grain sufficiently developed to germinate—has the highest nutritive value, especially for horses. Where a farmer is cutting for his own use, or for the better-informed consumer, I think it is to be recommended to allow a fair grain to form. This applies to wheaten hay, but it applies without doubt to oat hay. Oats are a constant source of disappointment in this colony in this relation, some varieties more than others, but all more or less, and I believe the disappointment results from cutting too green. Many varieties of oats cut green make bitter hay, and are unpalatable to stock; Tartarian oats, for example, will even scour stock when cut green for hay. All round, with oats, I certainly favor the practice of allowing them to get practically ripe before cutting. Cape oats, I believe, to be one of the best all-round forms of cereal hay; but whether they are to be preferred to real first class clean wheaten hay I am not prepared to say, both I would say are good.

I have given some amount of inquiry to this, and it is curious that there is no data available on which to base an absolute opinion. Had this question arisen in the United States it would have been taken up by the Experimental Stations, and they would have carried out exhaustive tests. We have not got them, and I think the general experience of farmers is in favor of the maturer wheat for hay.

Mr. T. HARDY (Central Bureau): I believe, Mr. Chairman, that you invited members to continue the discussion on the question of the provision of fodder for years of drought. I do not know whether it has come to your knowledge that in New Zealand a large area has been sown with furze, which has been found by experiment to be a very valuable food, especially for sheep. It is cut by mowing machines and raked up and stacked, and I was told by a pastoralist when I recently visited New Zealand that it must be cut down every second year. If it is allowed to go longer than that it becomes hard and the stock do not like it.

The CHAIRMAN: Lately I wrote a paper upon this question for the *Journal* and it was rejected by the General Secretary. I think what Mr. Hardy has said is well worth considering. There are many spots, more especially in the southern parts of South Australia where the furze is apparently a nuisance, but if men are actually planting it in New Zealand there must be some use for it. In that country they have a special crushing machine, and the sheep are able to consume it in large quantities.

The GENERAL SECRETARY: I think an explanation is due from me about my cruelty in rejecting the Chairman's paper on furze. Only a number or two previously I had published all that I thought it was possible to publish on the subject, and it was no use repeating it. If I did not know better I should think our Chairman does not read the *Journal*. Probably he overlooked that particular article, as well as other references to the value of furze.

Mr. T. GUM (Amyton): One of the matters no one has touched on is the statement in the paper that for sowing the second year's crop Mr. Davis prefers the scarifier to the plough. I ask if this is in accordance with the opinions of the Conference, because we find the opposite in our district.

Mr. DALL: For many years my experience corresponded with that of Mr. Davis—that we got a better crop after a second years scarifying than after ploughing.

Mr. J. SCHINCKEL (Naracoorte): Does Mr. Davis recommend round or square corners for stacks?

Mr. DAVIS: We have tried nearly every shape of stack, and we find, more especially when building with the fork, that square corners are much the best. You cannot pack round corners tight enough, whereas with the square corners you can cross the butts of the sheaves, and they bind the stack together. As to scarifying, I can bear out what Mr. Dall has said. We find that in a good

wet season ploughing is all right, but in a dry season we should get very little crop. With scarifying the native grasses come on far better also.

The CHAIRMAN: I believe no one has touched on the point that land that has been manured for a crop is far better for grazing afterwards because of the manuring. It is even a question whether it is not worth while using artificial fertilisers for the grass alone.

The Dairying Industry.

Mr. W. A. LEE (Gumeracha) read the following paper:—

This subject of late years has engaged a great deal of attention, and much has been and is being written on the subject. It is therefore difficult to break fresh ground or advance anything that is new. It is alleged by many writers that the butter shipped from the colonies has deteriorated, various reasons being advanced as the cause. One of the strongest arguments advanced is the increasing number of hand separators in use, and will probably in the near future be the means of closing some of our factories as milk-receiving depôts and transforming them into centres for the purchase of cream and the manufacture of butter from it; and it behoves the directors and managers of factories to be fully alive to this phase of the dairying industry, and if possible to educate the suppliers up to see the necessity of doing all in their power to deliver the cream in good order, so as to prevent all possible risk of an inferior article being made.

Theoretically the factory system is the correct one for producing the best class of butter. The manager is supposed to receive all the milk perfectly sound and sweet, the supplier getting his skim back in the same condition; but in practice we find that, although some of our producers take every care of their milk, others are not so particular, the result being general dissatisfaction. This is the general state of affairs throughout the colonies. The supplier wants his proportion of skim milk back, but is often unable to obtain it, the early comers having taken their own share and his too, and his calves and pigs are kept on short commons: so he eventually purchases a separator and keeps his milk at home, either making his own butter or sending the cream to a factory to be made up. Here, again, we are afraid the same element of danger will occur, *e.g.*, that the producer who was careless in the quality and condition of the milk supplied to the factory will be equally careless with his cream, and, unless great discrimination is shown by the manager in sampling and grading, the result will be detrimental to the produce manufactured. To ensure a good article milk should be separated direct from the cow and at a temperature of not less than 86° F.; some writers say 100° F. is better. If milk is kept over night it should be brought up to the proper temperature before it is separated or a loss will occur through some of the fat globules passing out with the skim milk. Run some hot water through the separator before and after separating, and do not start putting milk through before the correct speed is attained. Unless the correct temperature of the milk and speed of the machine is maintained there will be a considerable variation in the quality of the cream. In placing additional cream into the same vessel stir and mix thoroughly, but do not add any new cream to the bulk within twelve hours before churning, or if delivering to a factory do not mix the last cream separated, but rather bring it by itself. If this is not attended to a loss of butter will occur, unsatisfactory alike to manager and supplier. Cream should be delivered at the factory at least every other day, or collected by the factory at stated times, a small charge being made to cover the cost. I believe this would be the better way, and would prove advantageous to all parties and ensure its being received at the factory in good order instead of being kept until over-ripe, as it often is when the quantity is small. Cream can be purchased satisfactorily by the Babcock test, which we have proved by actual churning to be correct. Each supplier's cream should be thoroughly mixed and carefully sampled for testing, after which it can be mixed with the other cream of similar quality and condition, any that is stale or off being made into second quality butter. If proper care is taken by supplier and manager, butter can be made of superior quality; but to attain the best results suppliers and manager must work harmoniously, the former by delivering good cream and the latter by careful and intelligent manipulation. If perfect cleanliness from start to finish is insisted on, and proper precautions taken to ensure a good article, I do not think so many complaints will be made about the inferior quality of some of the butter exported. The true reason is, probably, cream kept until over-ripe, afterwards carried long distances by rail or road; and, as a consequence, deterioration in quality and value.

The dairy industry, even in this colony, has assumed large proportions, the exports for the past season being 1,867,157 lbs., valued at £81,083, and with favorable seasons this will be largely exceeded in the near future; and our endeavor must be to keep well abreast of the times, and see that only the best is good enough; then the financial returns will be satisfactory to all concerned.

Mr. CHAPMAN: While I am very much obliged to the writer for his paper, I certainly expected to hear some directions for making good butter. To do this it is absolutely necessary to have proper separation from the butter milk as soon as the butter appears in granular form. We must be very careful too in the salting, and in the quality of the salt used. Farmers should keep these things before them.

Mr. LEE: I must explain that I am not a butter maker, but I have handled a lot of milk and cream as secretary to a factory, and have had to do a lot of testing. What I want to emphasise more particularly is, in the first place, that cream or milk must be taken every care of. That is the groundwork of good butter. There is a good deal in the churning and salting, of course, but you may churn or salt as much as you like, you will never good butter from bad cream.

Mr. E. C. BATES (Naracoorte): We ought to start at the very beginning with the breeding of the cows and milking. I have seen fairly successful farmers dip their hands in the milk and wash the teats with it before milking a cow, and very few wash them with warm water as they should do. Butter should not be churned too much so that the grains gather into lumps. By stopping the churn at the proper time, while the grains are small, you can wash and salt the butter far better than if it is in large lumps.

Mr. GRAY (Amyton): I would like to ask whether it is usual at all the factories to use the Babcock tester for testing cream. In the north there is a fair amount of dairying being done, and a farmer usually has his own separator and sends the cream to a factory. I believe that is the best thing to do, but the difficulty is that we have not been able to get satisfactory returns from it. I have sent cream to Broken Hill and got 19lb. to 21lb. of butter from 5galls., and when I sent the same kind of cream to Adelaide—sending one week to Broken Hill and the next to Adelaide—I have only got 10lbs. or 12lbs. to the 5galls. We have churned the same quantity, and made 22lbs. of butter from it. I think that has been the experience of many of our dairymen, and I have often wondered whether these small quantities of cream are each tested to get at the quality, whether they use the Babcock tester or just guess at it. Sometimes when we start sending to a factory we get a very good return; then it gradually falls off until we complain, when it goes up for a while.

Mr. LEE: As far as I am aware I do not think cream is purchased anywhere in South Australia on the Babcock test, although it is carried out in New South Wales and Victoria. Probably it is too much trouble for some buyers, or they do not understand it and will not take it up. The result is that you may get a good return sometimes, and at others it goes all abroad. I have heard people in our district complain that when sending cream to Adelaide the returns go down till they begin to growl, and then it rises again for a time. I do not profess to know how they work it; but I do know that without a tester you must churn every lot of cream separately, or you cannot get a correct result. You may think you are an expert at judging the quality of cream and able to tell what it will produce, but it is very deceptive, as you will find if you try with a testing churn. There is no more correct tester than the Babcock, although there will be variations even with that from week to week if you are not exceedingly careful how you take the cream off. The temperature and the speed of the separator may have something to do with the variation. Some three or four months ago we received cream from the Springton creamery; I tested it with the Babcock, and for months it did not vary more than 1 per cent. It never fell to 49lbs. or went up to 51lbs. of butter in 100lbs. of cream, and the conclusion I came to was that the creamery people had a proper heater, and kept the milk at the same temperature right through.

Mr. T. WILKS (Mount Bryan East): I have been doing a little dairying for several years now. At the start we made our own butter, but later on we sent the cream to Adelaide. I have been getting 15½lbs. from 8galls. of cream, and 23lbs. from 5galls., and besides getting 3d. a pound more for the butter than we received for what we made ourselves.

Mr. JAENSCH: Were the cans sent locked when these small returns were obtained. We have had deficiencies of 7lbs., and I have an impression the cream is sometimes tested on the way!

The CHAIRMAN: I was told only about ten days ago of a person whose returns fell off steadily while he sent his cream to Adelaide, at last made it into butter himself and got 30lbs. more than he was getting credit for at the factory.

Mr. J. SMITH (Hawker): We have had the same trouble in our district, and I think the Bureau should take the matter up and see if they can suggest some remedy. When a man sends down cream and only gets half the proper quantity of butter, either someone is acting dishonestly or we have been deceived. We cannot let this matter drop now, we have gone too far to turn back. We have committed ourselves to the statement that the people to whom we have been sending cream are cheating us, and if they are it is time we stopped them.

The GENERAL SECRETARY: I remember—it is some years ago now and probably it has been stopped—a young man employed at the railway station told me in confidence that he and several of his friends had jolly good feeds out of the cream cans. One evening while sampling a can of cream someone brought a light, and it disclosed some squirming things in the cream about 6in. long. He said, “No more cream for me.”

Mr. F. DROGEMULLER (Woodside): As regards the quantity of butter to be realised from cream, at the worst time of a bad season I never got less than 17lbs. from 4galls., and in good times 20lbs. There seems to be some foul play going on somewhere.

Take-all.

The CHAIRMAN: I have received specimens of supposed take-all from Mr. Preiss, of Mannum, and have sent them to Professor Frank, of Berlin, who at the present moment is one of the best known scientists in this matter, and who has kindly offered to investigate the subject if specimens are forwarded to him.

Mr. JAENSCH: I have had take-all and I have not got it now. That seems to show it can be got rid of. The take-all was spreading regularly when the stinkwort appeared. I did not like the stinkwort when it came, but I have never seen the take-all since. Can anyone say if they have seen take-all and stinkwort together?

The CHAIRMAN: Did you manure the land with superphosphate?

Mr. JAENSCH: No; no manure went on the ground at all.

Mr. McEWIN: My impression is that take-all is caused by want of plant food in the ground. A neighbor of mine fallowed a paddock last year with the exception of a strip through the centre, which he left for a track until September. This year he put the paddock in with wheat, about the second or third week in April.

The CHAIRMAN: Dry?

Mr. McEWIN: Yes, with the exception of about twenty-five acres of it. That chain strip nearly all went with take-all, while the rest of the paddock is standing 2ft. 6in. high, with a promise of a 25bush. crop. I have a paddock of 200 acres which was fallowed in July last. I put it in, and it is a magnificent looking crop—looks like going 20bush. to 25bush. I have another paddock of 100 acres which I did not fallow until later, in August and the beginning of September. I sowed it at the end of May with the drill and superphosphates. At present

there is no take-all showing in it, and my impression is that the plant is so healthy that it is not going to affect it. I believe that early fallowing and the use of manure will prevent take-all. On the Peninsula they had take-all very badly at one time, but now they are using manures so largely it appears to have disappeared. I do not know what the deficiency in the soil is which causes it. Can anyone say?

Mr. GRASBY: Is it fallowing dry?

Mr. McEWIN: No. I have seen take-all very bad on a wet fallow. I think the analyses arranged for by the Chairman will be very valuable. They may show us what deficiency there is in the plant food of the soil to cause the disease.

The GENERAL SECRETARY: I am pretty well sure that a great deal of what is called take-all here is the same as what is called root-fail in England. It is caused by ploughing land up too dry, the result being that underneath the surface the soil is hollow in places. By and by, when the hot weather comes, when the roots get down into the hollow part the plant dies. The instances quoted by Mr. McEwin apparently point to the same conclusion, because the strip that showed take-all was not ploughed at the proper time. If your seed-bed is properly worked and a firm bottom secured, I believe you will soon get rid of the so-called take-all. At the same time you should use manures—phosphatic will be sufficient at present, but by and by you will need nitrogenous and potassic manures to supply other constituents required for plant food.

Mr. JORGENSEN: I do not quite agree with Mr. Molineux. Last year I fallowed some new land and ploughed it thoroughly, and I find spots of take-all in it. It comes in when the ground is thoroughly wet and the plant begins to go yellow. My belief is that there is an insect in the ground eating off the roots, and the consequence is the plants die. It does not go all through a paddock; sometimes the patches are only a few yards in extent. It is in the wettest places where it appears as a rule, but I have even seen it on limestone ridges, which seem very much affected with it.

The GENERAL SECRETARY: In your case it was probably too much wet that was the trouble.

Mr. PREISS: I would like to know if any member here has examined the roots of the affected plants. The roots are black, and if you strip off the fine fibre at the end the inside is dark grey or black. I am quite sure take-all does not result from the hollow ground, because where I have it the land is sandy and is quite solid. Some of the outside leaves are going now, and I find just one or two of the roots are attacked. There is no doubt it is some fungus that attacks the roots. I do not think it is caused by the pooriness of the ground, because where the plants are dying away most is on almost the richest spots, such as in the hollows and in the bottom of the gullies. We have thought that planting oats for a couple of seasons and then trying wheat again would counteract the pest, and so it does a little, but not much. If stinkwort does really clear the take-all away we shall not be so anxious to get rid of it in future.

Mr. DALL: I have had two rather severe experiences with take-all. In trying to cultivate the soil a little extra I put on a man to plough some land fairly deep, thinking, of course, I was doing a good thing. This piece of land when sown produced a crop which would lead you to think the ground was Bay of Biscay it was so uneven. Half of it went with the take-all, and the other half was a good crop. The other experience I had at Clarendon with a piece of really good land, and of course Clarendon is a good district with a splendid rainfall. The land was ploughed in the ordinary way and manured, and the crop was exceedingly good in some places and badly affected with take-all in others. Since I have been in the North I have come to the conclusion that too

deep ploughing, and ploughing in dry weather are both apt to lead to take-all. The remedy seems to be by using sheep on the farm as much as you can. They are a benefit to us in more ways than one, and I attribute to some extent the absence of take-all where sheep are to the fact that they tread the land finely and firmly, but at the same time lightly. I have found that land trodden by sheep ploughs much better than if trodden by cattle. The sheep tread the surface and pack it together, but not the under part, and when running over a fallow they have a beneficial effect in this respect. Then, again, if land is evenly worked it is a very great advantage. It used to be thought that land should be worked deeply, but we are not quite so fond of work as our fathers were, so we do not do it for its own sake where there is nothing to be gained by it. Land that is ploughed to a moderate depth, and worked to a fine tilth, is quite as good, if not better, than if deeply worked. I would rather have my farm cultivated 3in. deep with a fine tilth than 5in. not so fine. I am of course not now referring to ploughing but to scarifying, harrowing, &c. If you also use commercial fertilisers—English supers. have done the best with us—you will not have much take-all. No doubt it will come occasionally, but if your cultivation is not too deep, and manure is liberally used, I do not think it will do much damage.

The CHAIRMAN: I entirely agree with Mr. Dall that ploughing dry has done some of the damage. I ploughed twice—a thing I never did before—and I ploughed the second time dry. The result was that from ten acres I had only five sheaves of hay. I had another piece of land upon which I brought my stockyard manure, and the crop was so high that when I was standing in the furrow with a belltopper on I could not be seen. The next year I did not manure, and the crop was about 9in. high, and it gradually went off till there was nothing left. I thought if take-all was coming like that it was time to clear out. I even got take-all on a piece of new land which I ploughed. I did not roll it. Perhaps if I had done so the take-all might not have appeared.

WEDNESDAY EVENING SESSION.

Preparation of the Soil for the Reception of Seed.

Mr. R. MARSHALL read the following paper:—

In the preparation of this paper I am dealing almost entirely with the methods of my own practice as a farmer in the Lower North, where the average rainfall is about 10in. per annum. Some years the register is considerably below this quantity.

First, I may say I am dealing only with the treatment of fallow land, as I do not believe in sowing anything but fallow. In breaking up the soil for fallow I feel I cannot emphasise too strongly the necessity for early ploughing and the breaking down of the land as soon as possible after the plough with chisel-pointed or other harrows—chisel-pointed preferably—because it breaks up the surface better, killing more of the weeds that have already grown and leaving the land in a better condition to retain the moisture and receive any further supply, while dormant seeds of weeds under such conditions will germinate freely. I always like to finish ploughing my fallow before the middle of July if possible, putting on all the strength possible directly seeding is finished. This year my sons, who are now working the farm, had nearly 900 acres fallowed by the middle of July. No given rule, I think, can be laid down as to depth for ploughing; everyone must be guided by the necessities of his soil. My own practice is to plough about 4½in. to 5in. deep, sometimes a little more and sometimes a little less. After fallowing is finished the work of scarifying should be taken in hand as soon as possible and continued until the whole is completed. In this connection, I think it is hardly possible to stir the soil too much while under fallow, it brings it to a good tilth, and renders it in a better mechanical condition to receive and retain moisture for the succeeding crop, the advantage of which can hardly be overestimated in the Northern Districts, and should be a leading idea in the preparation of the land for the reception of the seed. In dry seasons, moisture so conserved is probably equal to three or four inches of rain as compared to late and badly worked fallows. Under the foregoing conditions, with the aid of fertilisers, and a

good selection of wheat for seed, I have no hesitation in saying that most farmers in the Lower North could reap an average of 16 bush. per acre, even under the dry conditions that have prevailed during the past few years.

Every farmer, I presume, is fully alive to the advantage of keeping sheep on his farm for the purpose of keeping weeds in check, which spring up on the fallow occasionally when other pressing work has his attention, independent of their otherwise profitable returns. The value of sheep to the farmer has been dealt with so often that there is no necessity to refer further to it here, beyond that I am a strong believer in keeping sheep on the farm; I would, however, advise that sheep should be relied on only as an aid in keeping the fallow clean. I believe most farmers now recognise that the use of fertilisers has become absolutely necessary to profitable farming. Having recognised this, the question arises how best to apply them. If bonedust is used, I have no hesitation in saying the best results will be obtained if applied to the soil and fallowed under early in the season; the resulting crop will derive much more benefit than if applied to the soil at seeding-time, because of its being in a more available condition, and the plant can all the more readily assimilate it as food. This applies equally to other slow acting fertilisers.

In regard to the application of English superphosphate, I am prepared to find my opinions run counter to many practical farmers and others who frequently—I might say always—hold up the use of the seed drill as the sole means of obtaining such excellent results, because of placing the seed and manure in contact with each other in the soil. At the same time, I am fully convinced from my own practice, equally good results can be obtained by applying superphosphate to the soil any time between harvest and seedtime, either with the seed drill, or any other means of covering it under at a reasonable depth. The manure is thus placed in the soil when the land works light, seeding is greatly facilitated by allowing the extra horse strength—that would be required for working the drills—used on other necessary implements, for getting in the seed with the use of the broadcast seed-sower will generally allow seeding to be completed during the early part of the season (May). That any compensating advantages gained by the use of the drill in placing the seed and manure together, if any, are more than compensated by saving of time and labor under the broadcast system. The good results gained by the use of the seed and fertiliser drills are due almost, if not entirely, to the fertilisers, quite independent of the seed drill. In this connection I think the seed drill altogether too expensive and elaborate for the distribution of fertilisers only. That a simple and comparatively inexpensive arrangement can and will be invented to work on the scarifier, driven by sprockets from the scarifier wheels, I am sure. Such an implement would give the additional advantage of moving all the land when distributing the manure; or the seed and manure could be placed in the ground at one operation with little if any disadvantage compared to the use of the seed drill. In this connection I will name a friend of mine, Mr. James Arnold, of Roseworthy, who always broadcasts his English superphosphate, and has never used a seed drill. Yet his crops are, as a rule, quite equal to anything grown in that district, and vastly superior to the average of the district. Although I am possessed of two 13-coulter seed drills we seldom use either for drilling in the seed and manure together. And when they are used for that purpose the coulters are usually cast off the seed and manure sown on the surface, and covered with the scarifier following after the drill. My results from this method of applying the seed and manure together, I think, have been quite equal to the ordinary method of drilling seed and manure together. This system has several advantages. The seed is put in much quicker and with less labor than is the case with the seed and fertiliser drill. A little rain will stop the work with the drill for several days, but under the other system the work can be got on with directly the weather breaks. Seeding need not be commenced till the soil is in good condition, and can be finished in reasonable time. The land I have been farming consists of all classes, from light sand to heavy and Bay of Biscay ground. Under the system outlined, this year we finished seeding over 800 acres in less than four weeks, using two 15 and one 19 tine scarifiers, followed by a team harrowing. The strength of horses was 32; of course, they are well fed and kept in good condition. I fully expect the hints I have thrown out will be severely criticised, because they run counter to accepted and conceived notions, but I hope will not be condemned without trial, especially by those not yet possessed of a seed drill. If my theory is proved wrong in practice, no one will be more pleased than myself to be shown I have been travelling on the wrong track.

Mr. GUM (Amyton) asked which is the best implement for working fallow or cultivating for the second crop after fallowing, the scarifier or the skim plough. This was debated with the paper.

Mr. SMITH (Hawker): I agree pretty well with all this most excellent paper except the remarks with reference to drills. Every farmer will agree with what Mr. Marshall says about fallowing. We have not had long experience with the drill in our district, but we have had sufficient to teach us that drilling

gives us better results even without manure than broadcasting. We had an experiment last year by drilling wheat in with manure, drilling without manure, and broadcasting, all on the same kind of soil. At reaping time the drilled and manured wheat was a long way the best, while that drilled without manure was a long way ahead of the broadcasted. Several trials brought about the same result. The broadcasted wheat did not seem to take sufficient root to hold up, so that when a gale came—and we have heavy gales up our way—most of it went down. The wheat drilled without manure stood the test of that gale, and was a perfect crop as far as it grew—that is, the reaper got all that was there. So that I cannot agree that broadcasting is as good as the drill. Some of the seed gets buried too deeply and some too shallow. The latter is not properly rooted when the September or October gales come, and we find our greatest difficulty in husbanding our crops is that it often comes to the ground with these gales. Right or wrong, we are firmly of opinion that the drill will prevent the wheat from coming to the ground. Then, again, the drill is not so expensive as one would think. It is certainly expensive in the first place, but the saving in seed alone will in time repay the cost of the machine. I know a man who for an experiment sowed three-quarters of a bushel to the acre broadcast and 25lbs. with the drill, and he got a better average from the drilled crop with less seed than from the other. This year again he sowed a bushel to the acre broadcast and 30lbs. by the drill without manure, and the latter is considerably the better crop. We have come to the conclusion that as soon as we can afford to get drills none of us will be without them. We do not know whether manures will greatly increase the yield in our dry district, but the drill will give us a uniform crop.

The CHAIRMAN: Is yours a sandy soil?

Mr. SMITH: The soil is of all kinds. We have Bay of Biscay land, red soil, bluebush land, light soil, and sandy soils as well. In one paddock we often have five or six different soils, and this is our greatest difficulty in manuring, as each soil may require a different manure.

Mr. GRAY: The information Mr. Smith has given us is very valuable, but most of us would like to know how he covered the broadcasted seed, whether it was just simply harrowed or ploughed.

Mr. SMITH: It was harrowed. We have tried ploughing it in, and have never seen it again when we did. Perhaps that is because we have very light rains up our way. We ploughed some in this year, and it came through, but we had heavy rains in July to help it.

Mr. A. C. HIRSCH (Hawker): I can indorse Mr. Smith's remarks. I have watched the experiments he speaks of, and everything he says is perfectly correct. I have tried both harrowing and ploughing, but in neither way will the wheat stand the storms we have in the North. I used manures three years ago, and ever since in small plots for experimental purposes, but the droughty seasons are against the chance of success with them. If we were certain of getting only a moderate season, we could afford to risk an extra 4s. or 5s. to the acre, and I believe it would pay us handsomely, but unfortunately we have total failures, and so we cannot afford to risk the loss of the manures as well as of the crop. Even this year, with 7in. of rain—3in. of which was no good, because we had a spell of dry weather—I used manures, and to my astonishment the crop is just double that where there is no manure. The drill is a great advantage in every respect, because you not only save seed by it, but get it evenly distributed at a proper depth. The only fault I find is that it is apt to work a little too deep, but then ours is a nice light loamy soil, which allows the drill to go down. A few of us have altered our drills to run them shallower. When wheat is too deep, it will form a second root by-and-by about 1in. below the surface, and the first root lower down dies off.

Mr. WHITTAKER: I would like to ask Mr. Marshall how he distributes his manure broadcast, whether with a seed sower or by hand?

Mr. MARSHALL: With drills. We have two drills, and keep them going between harvest and seed time.

Mr. WHITTAKER: Then you do advocate distributing the manure with the drill.

Mr. MARSHALL: No. As I say in my paper, I should like to see a simpler machine for doing the work.

Mr. McEWIN: I have tried the drill with manure, and I have tried it without manure, and I have tried broadcasting. The drilling without manure I found to be no advantage over the broadcasting. I tried it carefully, and reaped the crops separately, and I do not think there was a pound difference in the yield. My experience was that the wheat went down worse when drilled than when broadcasted. There is an old principle in sowing seeds, which is that they should be put in double their own depth, and I believe that is the idea that gardeners generally go on.

The GENERAL SECRETARY: Once their own depth, not twice.

Mr. McEWIN: I do not know, I thought it was twice. At any rate I was very much struck with Mr. Marshall's paper, and some of my experiences have been the same as his. I knew a man who wanted to manure a paddock some distance from his house, and as it was a calm day he thought he would not trouble to take the drill, so he used a broadcast machine. By the time he got to the paddock, however, a furious north wind was blowing. He started to broadcast at the north of the paddock, but even then the wind seemed to carry the manure right out of the field. However, as the land to the south was his also, he did not mind much, and went on with the work. Now that the crop is up, you can see plainly where he went with the manure by the superiority of the crop over the other part. I do not see why we should not be able to do without all the big expense of buying drills. A member of our Bureau drilled in some manure in February last year, and at the same time broadcasted some. The result was about the same, as he got about 16 bush. to the acre from each, but the part that was broadcasted was the better. Another thing is that if you have 400 acres to get over with only one drill it makes seeding too long. Again, if the ground is thoroughly wet the drill will leave furrows all along the paddock, and last year the mice were so bad that if you did not harrow, they ran along the drill marks and had the seed out before the next morning.

Mr. R. HULL (Colton): I can bear out the statement of Mr. McEwin about mice. Probably we shall see the day when a machine will be made to plant and cover the grain at a given depth, and at the same time be quicker than the drill. Still I believe the drill is a good thing, because it has brought about a better state of cultivation. We have an implement in our district like the paring plough, and one of the makers attaches tubes in front to drop the seed into furrows, which are covered by the plough as it goes along. It acts in the same way as the drill, but does the whole operation right away with the one team. I am very pleased with Mr. Marshall's paper, which is a very practical one.

Mr. J. MCCOLL (Richman's Creek): I think the difference in the results from drilling wheat can be accounted for. Our friends from Hawker are dealing with a dry country. We drilled some in after March, and the drill was working for three weeks; we hardly expected the last of it to come up at all, but it did, and grew well, whilst the wheat which was scarified did not come up half as well. The drill required less seed also. On the average we sowed seven and one-third acres to the bag with the drill, while a bag broadcasted only covered about three-quarters of that area. The scarifier does not

bury the seed to an equal depth. I do not think we can be too early with fallowing, especially in the dry northern climate, as the more moisture we can conserve in the fallow the better for the crop. I should like to see a better kind of harrow for working the fallows than we have had in the past. Until just of late very little attention has been given to the improvement of this implement. We have had little experience with the drill in our district, because we only commenced drilling this year, but so far we are satisfied that the drill with the use of English superphosphates is going to increase our yields considerably and pay well.

Mr. J. KELLY (Mount Templeton): We have been using the drill for the last three years, drilling in the seed and manure together, and in this way the wheat seems to get a start which enables it to get away from the oats. If the manure is broadcasted I should think it would help the oats as well as the wheat.

Mr. J. BROWN (Port Elliot): I am pleased with the paper as far as it goes, but much of its does not apply to a considerable portion of the colony. For instance, in our district we cannot fallow. I can cultivate without fallowing, and I find it pays me as well to grow a crop as to fallow—probably better. As we are not able to fallow, it would never do for us to sow the manure before the seed, as we have always got a certain amount of grass seeds and oats in the land. We cannot plough until about May 1st, so that we have only about two months for seeding operations. If it were not for the drill putting the manure in with the seed, we would not be able to get the crops up at all. At one time I was in favor of sowing the manure beforehand, but I was wrong, because in that case the grass and wild oats get the benefit of it before the wheat goes in. By using the drill the wheat gets all the benefit, and the weeds do not get a start. I have used a good many kinds of manures, and I think it is a mistake to put superphosphates into ground—unless it is a stiff clay—without the seed. Mr. Marshall probably lays his land out for grass, and he may get the benefit of the manure in that way; but for my part I should prefer a less soluble manure if I were using it beforehand.

Mr. MARSHALL: Why cannot you fallow?

Mr. BROWN: Because in the southern districts we have only a small amount of land and no room to extend, and it pays better to grow a crop of peas than to fallow. We get the nitrogen from the peas and we get the crop, so that if we can keep the ground clean for the wheat we gain both ways.

Mr. DUNSFORD: Very little information is gained from a paper like this, referring as it does to only one part of the colony. In the North we must fallow if we want to grow wheat at all. I farm on a system by which I crop the same land every third year. The first year we put in wheat, the next we keep the land for grass, and the third we fallow. What we need is an implement to bury the seed to an even depth, and we have it in the skim plough. If we want our crops to stand up against the storms we get, we must bury the seed uniformly, and we find about 2in. to be the best. I have two crops in Narridy which will give very good results; but then we have had rain this year, which I contend is a very good thing for wheat. (Loud laughter.) Super. is no doubt good, but in a dry climate like ours, where the wheat usually has as much as it can do to struggle out, it cannot be applied very much. We use principally farmyard manures as a rule, and though I do not want to run down commercial fertilisers, I think what we want more is careful cultivation and the drill for seeding.

The CHAIRMAN: I want to support what Mr. Brown has said. I farmed in the Bugle Ranges, though it is a long time ago now, and fallowing would not do there very well because we sometimes had so much rain that we wanted rather to conduct the water away than to conserve it.

Mr. R. RUDDOCK (Cradock): I am delighted that we have had a paper from such a capable gentleman as Mr. Marshall, and we are indebted to him for giving us the results of his long and valuable experiments. We are here to learn and not to converse about our own little experiences, and when we get a paper by a man who knows what he is talking about it is not right to take up time in the way we have been doing to-night. It seems to me as if there is no one subject on which the farmers can agree. Mr. Smith, of Hawker, who is nearly my neighbor, has said that when he ploughed the seed in he never got it up. My experience is——

A VOICE: I thought "our own little experiences" were not wanted. (Laughter.)

Mr. RUDDOCK: I skim-ploughed it in, and I have got a prospect of a very good crop. Of course if it is ploughed in 3in. or 4in. you need not expect to see it again, but if it is put in 2in. deep it will be all right, provided the ground is not left in furrows. It is as well to drag something over it to level it.

Mr. E. J. SHIPWAY (Koolunga): I feel indebted to Mr. Marshall for his very able paper. If I had heard him before I purchased a drill I should have saved the money and waited a few years. My first experience with a seed drill was many years ago. It was a cumbersome affair which took three men to work, and it was tried for many years at Currency Creek, but it was too expensive for my father who had it, and he abandoned it and instead he got a good heavy log to mark the furrows for the seed and then harrowed it across. From that time I have had a strong prejudice against seed drills, and now that I hear that Mr. Marshall can get 16bush without them I am sorry I bought one.

Mr. P. J. SPAIN (Port Pirie): I should like to know whether Mr. Marshall has any difficulty in distributing manures without using coulter.

Mr. MARSHALL: In reply to Mr. Shipway I would say we always use the drill for placing manure in the soil. When we distribute the seed and manure together with the drill we take off the coulter and harrow the seed in.

Mr. H. DAVIS (Riverton): I think we should all practise early fallowing. Mr. Marshall's remarks as to putting bonedust on I thoroughly agree with; those as to other fertilisers I should have more strongly agreed with at this time last year. We are all rather new with regard to these fertilisers, and I find that in a dry season it is all right to put them on the land early in the year, say in February or March; but this year I find that where manures have been applied to the land in February the crops have not done as well as those where the seed and fertilisers have been put in together, although in the latter case less manure was used. Some of my neighbors bought manures and borrowed their friends' drills, and put them in February and March. In one paddock a farmer put about 1cwt. of Thomas phosphate to the acre on some land in February. His neighbor put in about 70lbs. of Thomas phosphate with the seed in May. In both cases the land had been fallowed and worked in the same way. From present appearances that drilled with the manure will produce half a ton of hay or 5bush. or 6bush. of wheat more than the other. As to harrowing, I am sure Mr. Marshall never thinks of harrowing his broadcast seed in. He uses the scarifier and thoroughly covers the seed.

Mr. C. F. W. PFITZNER (Morgan): I can indorse Mr. Marshall's remarks to a great extent, especially with regard to the older districts where the land is hard and firm. I am farming some of the lightest soil in the county and some of the heaviest. I farm swamp, clay soil, and the lightest sand on the Murray, and I have had great results from the drill on some soils, but I think broadcasting is preferable sometimes, because the drill will not work some soils in a wet season. A little boy can work a drill all day if he can drive straight,

and if the seed is clean it will sow it uniformly all over. I only sow one bag to ten acres; if I sow more I get a smaller crop, because the heads are smaller, and so I get less grain. On a black swamp I got twelve bags (?) to the acre from one bag of seed to ten acres. Any practical farmer should have knowledge enough to know what land he should use the drill on. As to light working of fallow there will be an implement at the Show to-morrow for this purpose—the disc harrow. I believe I shall want no other implement than this for my loamy soil. A friend of my in New South Wales tells me that he uses nothing but the disc harrow in place of the stump-jumping plough.

A VOICE: Does it jump the stumps?

MR. PFITZNER: Not hard stumps, but it will cut any stump 4in. or 5in. thick. It must be eased over the others.

MR. GRASBY: I would ask Mr. Marshall to give us his experience with regard to the use of fertilisers in previous years. After what Mr. Davis has said, I think there will be a misapprehension if this question was not asked.

MR. MARSHALL: During the last twenty-nine years I have used fertilisers, particularly bonedust. At first we used to sow them by hand or with a Dobbie's seed-sower. Later on we got a drill. It is only during the past three or four years that we have been using English superphosphate, and it has given the best results. When we first started to use it I had only one drill, and, consequently, we had to distribute about half our manures broadcast. That was the rule throughout the district. Even Professor Lowrie admitted that one year the broadcast manure gave the best results at the Roseworthy College. Of course he said that was an exception. I heard Mr. Copley, M.P., relate an instance at Black Rock, where one year some seed sown with the drill never came up at all—it all malted. No doubt in this particular case the land was not damp enough to bring the seed away and just damp enough to malt it. That was my experience three years ago, and that is why I think broadcasting beat the drilling. When I first purchased two drills it was my intention to drill all the seed and manure together. We had about 200 acres out of a 300, acre paddock done when rain came, and we found the work too heavy for three horses. We put four horses in, and even then it was a very slow process, and I decided that the advantages gained by having the coulters on would be more than balanced by the loss of time, so we took them off and went over the land afterwards with scarifiers, and we got six bags to the acre that year. Since then we have sowed very little in the usual way. Last year the rainfall during the growing period was only 10in. and yet we reaped 500 tons of hay and 2,000 bags of wheat from about 700 acres.

MR. W. CORRELL (Minlaton): I can bear out the remarks of Mr. Marshall about seed malting. We started drilling one morning when there was a heavy dew. During the morning a dry north wind sprang up, and the ground became dry. What was sown in the morning came up all right and in the afternoon malted, probably for the reason Mr. Marshall has mentioned. A good deal has been said about seed and manure distributors, and as South Australia has produced the best plough in the world, and the best harvester in the stripper, I do not see why South Australia should not produce a better drill and manure distributor than the kind in use. I have invented one myself, and have just got the patent. It will not injure the grain and will distribute chaffed hay evenly if necessary.

MR. C. BELLING (Nantawarra): Has anyone made any experiments with regard to superphosphate? Last season we had several weeks of dry weather at seed time, and I want to know if the phosphate has a tendency in dry times to draw sufficient moisture to malt the grain. My experience is that it has.

MR. ANDERSON: No member has said anything about Mr. Smith's plough. I tried it on a crop which looks the best I have now. It has a drill in front,

and also distributes the manures. My son-in-law has a drill, but it is very hard to get oats through it—Cape oats especially. He mixed them with manure and ploughed them in with Smith's plough, and it is a fine crop.

MR. BROWN: I have tried experiments with superphosphate, and I find that if it happens to be dry weather the super. will kill the wheat sometimes.

A VOICE: Perhaps it is the pickling with bluestone.

MR. BROWN: The pickling does no harm if the wheat is allowed to dry. It always dries in half a dozen hours.

MR. MARSHALL: I have never found any ill effects from placing the seed and manure together, except three years ago. In a dry time it may, because the soil may be just moist enough to malt the grain without bringing it on.

MR. BROWN: In sowing French beans, if I use bonedust or bone super. with the beans I have sometimes got no beans at all. It is far better to sow the beans first and put the bonedust on the top of the ground afterwards.

MR. GRASBY: That is not due to malting.

MR. BROWN: I do not say that it is.

THE CHAIRMAN: Have you any information with regard to potatoes?

MR. BROWN: It has never hurt my potatoes, but I always put them in with the cut side down, and sow the manure so that it does not touch the cut sett.

MR. KENNEDY: The main question at present is whether it is best to put the manure in first and sow the seeds in afterwards in the drills along with or as near to the manure as possible. Does Mr. Marshall leave the rows open to show where the manure is?

MR. MARSHALL: No; we take no notice of where we put the manure. The wheat may be sown in another direction altogether to the manure.

MR. KENNEDY: That is what I wanted to know. This year, after seeing Mr. Marshall's remarks in the *Journal of Agriculture*, I took his advice and sowed five acres by his methods. Of course I do not know what the result will be. I sowed the manure with the drill and the wheat I broadcasted, and put two light horses to drag two sticks, about 6ft. long with a boy on top, to level it. It was all done in an hour and a half, and it is the best bit of wheat I have. The ground is smoothed down as flat as a pancake, and the wheat came away quickly, while a good deal of the other wheat malted. It was sown on April 25th, and it was pretty dry on the Peninsula at that time. With regard to putting seed in with artificial manure, I tried some experiments with potatoes, peas, carrots, lettuces, cabbages, and various other vegetables, and everything I put manure with was a total failure, while everything I used farm manure with is doing well.

THE CHAIRMAN: To what depth did you put the manure?

MR. KENNEDY: We put the manure to the usual depth—2in. or 3in.—the same as we should put manure with grain. We pay very little attention to the depth, and work the drills in the ordinary way.

MR. JORGENSEN: Is it not a lot of extra expense to sow the manure and grain separately?

MR. KENNEDY: No; we put the manure in before seeding time, and then we can choose our own time for sowing the seed.

MR. C. L. REUTER (Balaklava): My experience is that super. put in too close contact with the wheat will kill it. I found that by experiment.

THE GENERAL SECRETARY: Did you wet the super.?

MR. REUTER: No,

MR. CORRELL: Two years ago we mixed some superphosphate with wheat, and let it stand five or six days together, and then sowed it. I do not think one grain grew.

MR. KELLY: Many crops have done well with the manure mixed with the wheat and sown broadcast.

Mr. McEWIN: A friend of mine tried an experiment on this matter. He took three lots of 100 grains of wheat. With one lot he sowed equal to 200lbs. of fertiliser to the acre, with the next equal to 100lbs., and with the third no manure. It was all sown on similar land and watered all alike. Of the first lot 50 per cent. came up, of the second lot 75 per cent., and of the third the whole grew.

Mr. GRASBY: This matter of putting chemical manures with the seed is one that is not at all new. The explanation of the differing opinions held lies in the circumstances mentioned by some of the speakers. In the ordinary practice of sowing fertilisers with seed wheat a very small relative quantity is sown. Probably an average of 100lbs. per acre is about the mark, and you will see that that is very little compared with the ground it is mixed with. In nearly all the experiments related the quantity of fertiliser used has been relatively very much larger than that. I have continually been asked to advise people on this subject, and my advice has been that if they put more than a small amount it should be well mixed with the soil beforehand, and this is always done by experienced gardeners. If it is not done, instead of being a benefit it will probably kill the seeds.

The GENERAL SECRETARY: Some who are here will remember that a gentleman in North-west Wimmera "discovered" for himself and published very widely that if he wetted seed wheat and smothered it over with super, he got wonderful results. We do not hear very much about that now.

Mr. J. SCHINCKEL (Naracoorte): The mixing of phosphates with seed wheat and sowing it broadcast is still practised in the western district of Victoria. The best way to do it is to carry a little water and wet each bushel separately, because it soon dries. The man the General Secretary referred to has practised it for some years with good results. He only uses about 20lbs. of super to the acre.

Mr. E. C. BATES (Naracoorte): I should say the difficulty is with regard to the contracted area given to the seed in which to grow when the seed is thrown in with the fertiliser. It confines the roots to the radius of a very small circle.

Mr. MARSHALL: In reply to Mr. Brown's criticism, I would say that in my paper I simply dealt with my own practice in the North. If I were farming in the South I do not think I should fallow either, because a crop of peas would probably benefit the soil more than the fallow would, on account of the nitrogen they would supply. Besides there is the profit from the crop. That circumstance would hardly apply to the North, where we have to store up all the moisture we can for the drier seasons. One gentleman said he found the benefit of English superphosphate disappeared in one year; my experience is quite contrary to that. Where we have for experiment missed strips with the manure we have found a great difference in the grass in the following year. There has been just as much difference as in the wheat crop. The growth of grass on the manured part was twice as much as where we missed, and the stock seemed to do much better where we used it. I have noticed the same thing on my neighbor's land. The question has arisen as to how best to place our crops in the ground. Where we place manure in the soil it is all scarified in and harrowed. One gentleman said that by concentrating the manures in the drills with the wheat the crop got a start on the oats. Personally I try not to grow oats at all, but for dirty land there may be something in the argument. I have found no advantage in drilling seed and manure together, and my sons have given up the idea almost altogether. The crop this year looks well. Last year the drilled wheat was no better than the broadcast on land previously manured, and three years ago the drilled wheat was considerably the worse.

Wool and Wool-classing.

The GENERAL SECRETARY: Mr. George Jeffrey, Instructor in Wool-classing at the School of Mines and Industries, is here and, with the permission of the members, I would ask him to say a few words on sheep and wool.

Mr. JEFFREY: I did not come here this evening with the intention of speaking, but I am only too pleased to have an opportunity of saying a few words. I will not detain you very long, but I will make a few remarks on the kind of wool to grow, and more particularly the kind of Merino wool. Some of you have already heard my ideas on this question. I feel most strongly on it; in fact, it has become almost a matter of conscience with me to advocate the growing of strong, robust wool in preference to the finer wool which is grown in our Northern Areas. I advocate this because I believe it is the most payable, and the wool which pays best is the wool to grow. To start with I make the assertion that in South Australia, generally speaking, there is very little difference in the value of one kind of Merino wool as compared with another. The variation in price is brought about by the difference in condition. I mean that the difference between one wool which is, say, sold at 10d. a pound and that which only brings 7d. is, in ninety-nine cases out of a hundred, not because the tenpenny wool is finer or coarser, or has more lustre, or is sounder in fibre, but almost absolutely because of the fact that it is lighter in condition, and when scoured will give a bigger return of clean wool. This is very important, and I want to make it very clear. One per cent. difference in the yield when wool is worth about 7d. a pound means $\frac{1}{4}$ d. a pound in the greasy price to the buyer. For example, if you have wool which will yield 50 per cent., and that wool is worth 18d. a pound clean, the buyer can only give 9d., because half of it is of no value to him at all. If your wool will only yield 49 per cent., it is worth $\frac{1}{4}$ d. a pound less; if 51 per cent., it is worth $\frac{1}{4}$ d. more. There is practically no difference in the value of the different kinds of Merino wool in South Australia. I know it has been urged that the finer wool, because of its fineness, brings a bigger price, but I want you not to believe that I have been a woolbuyer for many years, and I know. It may be all very well for those who only want the finer wools, and it is their business to say so, because if they cannot get them they will have to seek "fresh woods and pastures new." If that be the case, the kind of wool to grow is that grown on the sheep which will give you the greatest quantity of clean wool; hence I am in favor of keeping the stronger-woolled sheep as against the one with fine wool. To start with, the stronger wool is generally grown on the larger-framed sheep. That being the case, having more surface on which to grow wool, you are likely to get more of it. Again, strong wool is usually grown on strong, hardy, robust, sheep. They will do better than sheep with finer wool, as the latter have a more delicate constitution. Those who have kept sheep know that as the sheep grow older their wool becomes finer. That in itself would be a small thing, but you also get less of it. The cause is a lack of vitality in the sheep as they grow old. Again, you find the wool from a lambing ewe is finer than that from a dry ewe, because so much is taken out of the ewe by the lamb that the wool is not fed in the way it would be if the lamb was not there to sap the mother. Still, again, in a good season the wool is stronger than in a bad season, because the sheep are in better heart, and are able to grow stronger wool. Do not all these things point to the fact that the constitution of the sheep affects the growth of the wool to a great extent? That being the case, if you have this strong-woolled, hardy, robust, sheep, you are likely to get more wool to start with, and also more wool for years to come. Again, the advantage of the sheep with the strong wool as against the finer one is apparent to the fat lamb raiser. In the first place, he will have a bigger lamb from a large-framed sheep than from a smaller one, and not only that, but he will get a far bigger fleece than he could possibly get from a fine-woolled sheep. Almost the only objection that can be

raised against this type of sheep, as against the other, is that the bigger an animal is the more it will eat. I do not think that objection holds good at all. As a matter of fact—and though one can hardly prove it directly, you can prove it by analogy—it is not necessarily so. Most farmers know that if you have two horses of the same type the stronger, hardier, and bigger of the two does not eat more than the smaller and more delicate. The same thing applies to pigs, and certainly it applies to human beings. That being the case I think I am safe in saying to the farmers here and to those who go in for sheep that they should only keep strong, hardy, robust sheep which grow strong wool with plenty of character. I am very sorry indeed to know that the position of the wool market is so extremely unsatisfactory, but after the exceedingly good year you had last season you must expect some reverses. The only thing I can say is that I hope the market will not be long in its present condition, and that the time will soon come when bigger prices will be obtained. Some people have hinted to me that because of the unsatisfactory prices it is of no use talking wool-classing now; that it was all very well in the good times, but out of place now. I think it is all the other way about. If ever there was need for careful and systematic classes it is when prices are low and when prices are low and you want to make the best of your wool. Those who have Merino and crossbred sheep should not think of mixing the two wools together. Shear them apart, so that the locks of one will not get mixed with the locks of the other. To the farmer who has only a few Merino sheep I say the less classing you do the better unless you have a greater knowledge of wool-classing than the ordinary farmer can possess. After I have been around amongst you I will show you and then you will not be far out. Just now, until you have had a chance of gaining some knowledge of the work, do not do very much; but skirt the wool regularly, not necessarily deeply and roll it up tidily from the breech to the shoulder so as to show the best part outward. Pack in bales which are not too large and heavy—about 3½ cwts. is quite heavy enough for ordinary wool. Brand your wool legibly, and do not give your broker limits when sending it down for sale, because the broker knows far better than the farmer about how to do his business. I hope you people have not the idea that the broker is the common enemy of the seller as I have heard suggested. I have heard some say, “We sell our wool one year at one place and the next at another because we are sure that the broker does his very best for us for one year and after that gets careless.” Can anything be more stupid? As a matter of fact he does nothing of the kind. Instead of the broker being an enemy to the farmer he is a friend, not because he is any more honest than any other class, but because it pays him. He is paid by results, and you may be pretty sure that the broker will do his very best for you on that account. I would have liked to have had more time to speak to you, but I am very pleased to have had the opportunity of saying these few words at this Congress. I have the kindest feelings towards the Agricultural Bureaus; they have been very good assistants to me in my work in the country districts, and I hope they will continue to be.

Mr. C. BELLING (Nantawarra): Would Mr. Jeffrey recommend crossbred sheep for farmers, or simply pure Merino?

Mr. JEFFREY: That depends on circumstances. There are circumstances in which it will be most advantageous for a farmer to have crossbred sheep, but in the limited time I had at my disposal I was only able to deal with the Merino.

THURSDAY MORNING SESSION.

Free Parliament.

A free parliament was held for the discussion of questions of interest to members.

Mixed Chaff.

Mr. J. SMITH (Hawker): I move—"That, in the opinion of this Congress, legislation should be enacted to compel merchants and others mixing chaffed straw or header straw with chaffed hay to brand the bags containing such mixture as 'Mixed Chaff.'" I did not know that I would take any action in this matter until yesterday, but this has been an injustice from which we have been suffering for some time. The practice came into vogue when the drought first set in. People found they could sell their straw with very little hay mixed with it for chaff, and they have kept up the practice even now that there is plenty of hay. We purchase what purports to be hay chaffed, and it turns out on examination to be more than half straw, and something should be done to prevent this. We have to pay for it on the railways as hay chaff, and we have to take delivery of it, because if we did not the demurrage expenses would be too heavy; so that a chaff merchant is pretty safe in sending what he likes, but there should be a penalty imposed for selling straw as hay. I do not object to people mixing it so long as the chaff is sold as "mixed," but it is a "get at" if we pay for good chaffed hay and do not get it. The farmers get a bad name for this, but it is not their fault, as the merchants do the mixing and only pay the farmer the straw price for the straw they buy. I would also like to mention a little matter connected with the retailing of hay, and that is that some sell as 50lbs. bags containing only 40lbs. It is an evil, because the honest man cannot sell a real 50lb.-bag as cheaply as these people sell the spurious one which only holds 40lbs.

Mr. E. C. BATES (Naracoorte): I second the motion. The cause of this evil is the header. I have seen wheat and oats put through the header and the straw mixed with hay in the proportion of two-thirds to one-third. This was chaffed and sold in competition with a good honest article.

The motion was carried.

Railway Passes for Delegates.

Mr. E. C. BATES (Naracoorte): I move—"That it be a recommendation from this Conference to the Minister of Agriculture that in future delegates to the annual Agricultural Bureau Congress receive second class passenger tickets." This is a delicate question, and has caused some little friction because of the class distinction. The majority of farmers in conducting their ordinary business would only take second class tickets when travelling, and that being so we should be satisfied with second class passes for the Congress. We have had first class this year, but it is an extravagance. We all know that the Central Bureau is not burdened with too much money, and the extra cost comes out of money which would otherwise be devoted to the business of the department, which, therefore, can disseminate so much less useful information for the benefit of the producers.

Mr. T. STANION (Tatiara): I second the motion and quite indorse what the previous speaker has said, but I think if we take second class tickets they ought not to be excursion tickets, because with them we cannot break the journey.

Mr. T. DUNSFORD (Narriby): I support the motion; it is a very good one. In coming down this time a lot of us did not have much enjoyment out of the journey because we felt out of place. The cocky talks very well about wheat, but in the first class carriages the fellows do not know anything about that.

Mr. A. L. McEWIN (Brinkworth): I move as an amendment that we adhere to the present plan, because it is quite a mistake to think first class tickets cost the Government anything more than the second; it is simply transferring the money from one pocket to another. I do not believe either it will make one penny difference to the department, because there is a special vote for the

railway fares. We are here on the business of the country, and many of us would not come down at all but for the Congress. I for one would not have come till later in the week, at any rate. The work we do entitles us to a first class ticket, and those who feel out of place in a first class carriage can travel second all the same.

Mr. J. HILL (Maitland): I second the amendment. It was no benefit for me to come by train. I came in the place of another member who could not get away, and to reach the train I had to go thirty miles by coach, which will cost me 9s. If I had come over later on, by the steamer excursion, I could have got across for 5s. return.

Mr. G. STONE (Port Germein): Seeing that we are on the business of the country, I think we should have first class tickets. The department does not suffer; in fact, it is benefited by the arrangement. I brought my wife down and paid first class fare for her; if I had travelled second class she would have gone with me. Many others did the same thing.

Mr. R. HULL (Colton): Nearly all those who have spoken have a railway, but I have none, and though I come 300 miles I have no pass. I think some little help should be given to Branches in the far outlying districts.

Mr. R. BUTLER, M.P.: As a member of the Bureau, as well as the Minister who introduced the system of free passes, I would like to say a few words. Until I was Minister of Agriculture the members of the Bureaus who attended the Congress had to pay their own fares. I—partly at the suggestion of Mr. Molineux—put £80 on the Estimates last year, in order that men who do so much in the interests of the country might have an opportunity of coming to Adelaide without paying the fare. It never occurred to me that they would prefer to travel first class, because I thought ninety-nine out of 100 of them would prefer to go second with their friends. It is quite a mistake to consider that the first class tickets entail no extra expenditure on the State, as the vote has been increased by £20 this year, and that amount is debited to the Bureau. I do not want to express any opinion as to the wisest course to adopt, but will simply say that if, when I was Minister of Agriculture, I had been asked for first class tickets I should not have stood in the way of granting them.

The GENERAL SECRETARY: I was trying for nine years to get this concession, and at last I prevailed on Mr. Butler to grant us second class tickets. Something was said about first class tickets, but I told him our members were not persons who put on frills, smoked fine cigars, and considered themselves to be fine blue-blooded gentlemen—they were like the ordinary gentleman of England, who travels second class when he cannot get third. I told him we did not consider ourselves a peculiar and particular people, to be highly honored on the one special occasion of coming to Adelaide for the Congress and at no other time. If we go any further than we have done we shall presently be asked for steamer fares down to the railway and coach fares, and this will be actual money out of the State pocket into private hands. The members of the Agricultural Bureau are honorable patriotic gentlemen who are doing good honorary work for the public, and if we pay them for their work we shall never be able to give them the full value of the services.

The amendment was lost by sixty votes to forty, and the motion was carried.

Government Importation of Fertilisers.

Mr. E. C. BATES (Naracoorte): I move that it be a recommendation from this Congress to the Government that they should import and sell commercial fertilisers to the producers. The present system of obtaining analyses takes too long, and if we do not get the manures analysed we are liable to be deceived. I do not think the inspector's work is sufficient protection to the farmers who cannot make chemical analyses themselves, and therefore we do

not know whether we have got a fair sample or not. The trouble is that if a farmer gets poor stuff and it does his crop no good he comes to the conclusion that fertilisers are of no use at all. If the Government import and sell the manures they will have no reason for deceiving us, and, in fact, it will be to the advantage of the country to give us a good article. We are not asking for any concession, because we shall pay for all we get. All we want is to get a good article when we pay for it. There is, however, one concession we may fairly ask for, and that is that if the manure can be sent in trucks which otherwise would be returned empty a reduction might be made in the cost of railway carriage.

Mr. T. DUNSFORD (Narridy): I second the motion.

Mr. J. CORRELL (Minlaton): There has been a good deal of discussion on this subject throughout the country, but as far as I am concerned I think the Fertilisers Act provides all the protection we need. If you unduly harass the importer of manures we have to pay the extra expense he is put to. If you will only study the question from a practical point of view and read the *Journal of Agriculture* you need not be "got at." If you go to a respectable firm they will, for the sake of their own reputation, give you what you pay for, and if a man is fool enough to buy an inferior manure it is his own fault. I know a firm that mixes gypsum and sulphuric acid and sells it as manure. I warned many people in our district against buying it, but still a large quantity was sold last year.

Mr. P. J. BYRNE (Dawson): I think it is a proper thing for the Government to import manure. Mr. Correll talks about respectable firms, but there are very few of them to be found. We do not ask for charity, but we want fair dealing.

Mr. J. BROWN (Port Elliot): The present Act, in my opinion, works very well, and I know a good deal about manures, as I both buy and sell them. I am a farmer, but when I sell manure I have to give a guarantee with it. I think that is good enough for the buyer's protection. I do not see what more the Government could do unless they gave us the stuff. Of course I would not mind that.

Mr. C. GOODE (Gladstone): I am opposed to the Government entering into competition with the firms who are already selling manures. The competition between themselves and the inspection are sufficient guarantee that the articles they sell will be up to the standard. As to carrying fertilisers free that would simply mean increasing the price of land to those who wish to buy for farming. The better course would be to knock the duties off agricultural implements and help the farmers in that way.

Mr. H. A. DAVIS (Riverton): I hope the Congress will not carry this motion. If anything more is done it should be in the direction of appointing an inspector to pass the manures in bulk.

The GENERAL SECRETARY: That is done now.

Mr. H. R. ANTUAR (Mylor): It is quite impracticable for the Government to undertake the importation of manures because there is the possibility of a shipment arriving in bad condition or of a low grade, and that would mean loss to the country, because it could not be sold to the farmers. Then the manures which are manufactured in South Australia would have to be carted to a central depôt, which would be a very large expense to the Government. A great deal of extra money would have to be spent also in the extra handling entailed, and the whole thing would be merely another millstone tied around the necks of the farmers, who are hampered enough now without being subjected to further disabilities. Let us give plenty of scope to those who are in the fertiliser industry and we shall be all right. The inspector is doing his best, and if farmers make full use of him and of the provisions in the Act they can be amply protected.

Mr. R. BUTLER, M.P. (Mallala): I piloted the Fertilisers Act through the Assembly, and it has done admirable work. There are a few small amendments needed, and they will be made this session. A more able and indefatigable officer than Mr. Summers we have never had in the department. I had the pleasure of appointing him, and I only wish he was better remunerated for his services. He has samples of all the manures imported carefully analysed, and takes them from the bulk as it arrives in the various ships.

The motion was lost. No member voted for it.

Railway Carriage of Fertilisers.

Mr. A. L. McEWAN (Brinkworth): I move—"That in view of the fact that every ton of fertiliser used by the farmer results on the average in an increase of at least 2 tons of wheat, this Congress is of opinion that the Government should consider the advisability of carrying fertilisers at actual cost, and also that twelve hours be allowed for unloading at the railways stations instead of eight hours at present." I was very much struck with what Mr. Kelly said yesterday, and, though I am not prepared to go to the length he wanted, I think something should be done. There is no occasion for me to say much with regard to this motion. It speaks for itself, and I leave the matter in the hands of the Congress.

Mr. JORGENSEN: I second the motion.

Mr. R. BUTLER, M.P.: It is hardly fair to those who live where there are no railways to ask that fertilisers should be carried at actual cost, because the railways ought to be made to pay a fair interest. I believe, however, that they should be carried at the minimum rate, and if that is done, and a reasonable time allowed for unloading, I think that is all that can be expected. I move as an amendment to strike out "actual cost" and substitute "the lowest rate."

Mr. R. HULL (Colton): I agree that it would be very unfair to those parts of the country where there are no railways to ask for the concession indicated in the motion. It is too much. They get free passes for the Congress now, and we have to pay, and I think it is unfair that farmers who have railway facilities should try to get everything.

Mr. DALL (Nantawarra): The people who have the railways have not all the advantages, as where water carriage is available it is much cheaper than rail carriage. If the railway reduced the freights a little they would not lose much, because they would get more traffic. For instance, we get our manure to Port Wakefield for 4s. a ton, or less by water from Port Adelaide, while the price by rail is 1s. a ton more even taking the truck load. I do not think it wise to ask the Government to do too much, but it would be fair to ask for carriage at the lowest rate.

Mr. J. BROWN: I am inclined to support the motion, especially the latter part of it, because it is very awkward if you live ten miles from a station and are not quite sure when the stuff is coming. I think, however, we should have two days instead of twelve working hours to remove the goods. There is a good deal of difference in the stationmasters. Some of them are very particular, and would almost like you to remove it before it comes.

Mr. W. TOWILL (Bowhill): As to the relative cost of water and rail carriage I may say it costs us 6s. 6d. by rail and 7s. 6d. by water, so that the Government are the more generous of the two.

Mr. J. G. PREISS (Mannum): In our case we have to pay much more for water carriage than for rail carriage. We use a lot of fertilisers—200 tons last year—and it will be thousands of tons before long. If the rail freights are reduced it will mean that those living away from railways will be at a disadvantage.

The CHAIRMAN: I think it will be well to put the motion in two parts—the first that the Congress is of opinion that fertilisers should be carried at actual cost, and the second dealing with the time for unloading.

Mr. Butler's amendment, that the Government should be asked to carry fertilisers at the lowest rates, was carried by ninety-six to twenty, and the first part of the motion, as amended, passed.

Mr. McEWIN: I am told that the time allowed is twelve hours now. In that case I would amend the motion by making the time two days. I believe if farmers will make arrangements with the stationmasters those officials will always give notice of the arrival of consignments. I think on the whole if we leave the matter of time to the Railways Commissioner he will see that justice is done.

It was decided to ask for an extension of time for unloading, the length of time to be granted to be left to the Railways Commissioner.

Stacking Ensilage.

Mr. GRAY (Amyton): I should like to know which is the best method of weighting a stack of ensilage. I have had no experience and was asked by a neighbor for information. Can anyone say?

The GENERAL SECRETARY: I think that is a proposition which would take rather too long to explain. It would be better if those members who have schemes would send down descriptions of them with drawings for publication in our *Journal*. That would be far more instructive than anything that could be said here.

Manuring in Dry Country.

Mr. J. W. DALL (Nantawarra): I wish to initiate a discussion on the subject of the advisability of using superphosphate in dry country. I brought forward this subject at the last Congress, and there were some who thought that if they used fertilisers in their dry areas—I think it applied more particularly to Quorn—it would spoil their crop. I was satisfied that it would not do so. The first experiment with manures in our district was made three years ago, during a very dry season, by Belling Bros., who are fairly large farmers. They had manured and unmanured wheat side by side, and the experiment proved that the wheat manured with English superphosphate stood the dry weather a great deal better than the other. It seemed to show that the manure forced the wheat along and got it past the very tender stage before the hot weather set in and the hot winds could take it. Ours is a fairly dry country. The average rainfall for many years has only been 14in., while for the last five years we have had to do with much less, as little as 8in. in some cases. My experience is that we may safely use manures in the driest country that is fit to cultivate, and I ask those members who have had experience to confirm me, if they can, for the benefit of those who have not yet tried it.

Mr. A. F. NOLL (Quorn): Some samples of wheat I brought down to the Congress show conclusively that fertilisers are a benefit to our district. They are not used much, but they have been a great advantage so far.

Mr. D. McNEIL (Wilson): Was that wheat grown on an overflow from a creek? It seems to me to be an extreme growth for the season.

Mr. NOLL: It is grown on ordinary soil and not on an overflow. There has been about 7½in. of rain this year where it was grown. We had manured and unmanured side by side in plots all sown about the 5th, 6th, or 7th of April. Some of the manured crops were 4ft. high, and the unmanured was fully a foot shorter and not nearly so well developed.

Mr. PREISS: We have found out this year that wheat sown with fertilisers comes up two days earlier than when not manured.

Mr. McNEIL: I tried fertilisers this season for the first time, and the plant is stronger than where no manure was used on the same kind of soil. It does not, however, seem to do as well on the red clay soils as on sandy soil.

Mr. H. ALDENHOVEN (Woolundunga): I have tried manures both on experimental plots and the ordinary cultivation paddock. In the paddock it did not seem to make much difference, which I attribute to the fact that the soil had been pretty well manured by the rabbits. I did not drill it, but sowed it broadcast. In the experimental plots the only difference was that the manured portion was evenly covered, while there were bare places in the other.

Mr. G. E. PATTINGALE (Port Broughton): With us the manured wheat has done just about twice as well as the other, both on fallowed and unfallowed land. Our rainfall is pretty light, generally about 10in.

Mr. E. H. WARREN: I have heard it said that in dry country wheat will malt more readily when manured than when not manured. Is that the general experience?

Mr. McNEIL: I sowed some about April 1st or 2nd. We had had a shower, and the ground was, I thought, moist enough to germinate the seed. It did not, but about three or four weeks later it came on with satisfactory results, and is now a thoroughly good plant.

Mr. D. F. KENNEDY: Most speakers seem to agree that the manures will not injure the wheat in the dry country, but a more important question is if you can profitably use fertilisers with an 8in. rainfall. I tried it near Kadina. I put in 10 tons of manure, costing £54, and after saving enough seed for the same ground all I got was £23 worth of wheat, so I contend it does not pay. I used English superphosphate.

The GENERAL SECRETARY: It is there for next year.

Mr. KENNEDY: It is not, because I have the land in this year and the manure has no effect on the crop.

Mr. DALL: Did you sow it on fallow land?

Mr. KENNEDY: Some on fallow, some on stubble.

Mr. DALL: Which gave the best result?

Mr. KENNEDY: The fallow. I contend that it will not pay with an 8in. rainfall to use fertilisers. Perhaps if the whole 8in. fell after the seed and manure were in the ground it might, but of that 8in. only about 5in. were of any value to us.

Mr. H. RICKETTS (Penola): What quantity of manure did you use to the acre?

Mr. DALL: We have generally used from 70lbs. to 80lbs., but it is said that benefit is derived from the use of 35lbs.

Mr. NOLL: We use about 80lbs. to the acre.

Attendance at Branch Meetings.

Mr. NOLL (Quorn): I want to ask if any Branch has adopted rules to ensure good attendance at Branch meetings? If so, I would like a copy of them, because poor attendance is a great drawback to the usefulness of the Branches.

Mr. PREISS (Mannum): We find a good secretary makes a great difference.

Mr. McEWIN (Brinkworth): In our Branch during the winter months we hold our meetings at farms, and the ladies entertain us. We see what progress the farmer has been making during the twelve months, and as we take our wives with us, we generally have a good time. Before we started that, the attendance at our meetings was not good. The members ought not to depend so much on the secretary, and each one should take a practical interest in the work of the Branch, giving his ideas freely, and not caring much if he is laughed at occasionally. I have been laughed at many a time, and I do not mind it at all.

Mr. ALDENHOVEN (Woolundunga): A good many Branches meet at farms now. Our Branch would have collapsed long before now but for the farm meetings.

Mr. E. J. HARRIS (Millicent): At our Branch we have an average attendance of eleven out of fifteen members, which is very good. We thought we were the first to originate farm meetings.

The GENERAL SECRETARY: No; Pine Forest.

Mr. HARRIS: Well, we were nearly the first, and we find it answers splendidly. One homestead meeting, and an inspection of a good man's work, does more good than half a dozen meetings in a council chamber or institute where there is so much jaw. We also have a rule that if a man absents himself for three consecutive meetings he is taken off the roll.

Mr. KENNEDY: It was not the Pine Forest Branch, but Mr. Molineux who was the originator of the idea of farm meetings. We took it up at Pine Forest a good many years ago, and it was the best thing we ever did. We criticise in the freest way any of the work of the farm, from the hanging of a gate to the building of a haystack, and the victim has to take it kindly. If we see a post hanging on the wire or a gate off its hinges we point it out, and this sort of thing has caused a friendly rivalry amongst us to have our places looked after, and everything in first-class order. Some people say this is only done once a year when the Bureau is coming, but if a place is put into good order it is generally some months at least before the effect has gone off. We introduced cricket, football, dances, recitations, and other amusements, and I have seen as many as 100 or 150 people at one Bureau meeting, and they all enjoyed themselves.

The GENERAL SECRETARY: There are two things I recommend the Branches to do. Some of the members attend three or four times during the year for the sake of the advantages they get from the Bureau, and they give no compensating advantage to the other members. They are cunning enough not to miss three consecutive meetings and so get struck off; so I recommend that instead of that rule the adoption of one making four attendances during the year compulsory, except when a member is prevented from attending by illness or unavoidable business. The other proposal is one which will be of immense practical advantage to the Bureau, and it is that each member should carry a little memorandum book, and note down in it between the meetings any idea which may strike him as being lately to contribute to the edification or instruction of his fellow members.

Mr. HULL: Would it be too much to ask the Central Bureau to notify any Branch where the attendance is unsatisfactory that certain members should be struck off the roll?

The GENERAL SECRETARY: If I did that I should be getting my head punched when I go into the country. (Laughter.)

Railway Carriage of Stock.

Mr. McEWIN: I move—"That this Congress impress upon Parliament the necessity for the Commissioner of Railways being responsible for the delivery of the number of stock to consignee that is delivered by the consignor to the stationmaster." There is a continual loss in stock coming through to Adelaide, and it is no small matter at the present prices, especially pigs. The Railway Department takes no responsibility, and if two pigs out of a consignment of 100 are lost they will not pay for them or account for them in any way. If the stock die on the way they should show why and where. A gentleman, only a few weeks ago, sent twenty pigs from Hamley Bridge, and when they arrived in Adelaide there was only nineteen, and he simply had to stand the loss. Two years ago I sent 100 good wethers to Adelaide and only ninety-eight

arrived. As they sold at 15s. each it was a loss of 30s. When a private individual takes stock for carriage he has to deliver as many as he gets, and it should be the same with the Government. There is a stationmaster or porter at each station where there are trucking yards, and they ought to be fully capable of counting the stock which they receive.

Mr. W. G. CLOUGH (Aldgate): Only about a month ago I delivered twenty-three sheep to the Railway Department. They were counted carefully and all branded, and were through the hands of the stock people, so there was no possibility of mistake. Yet only nineteen got to the end of the journey, and the railway people refused any responsibility.

Mr. E. J. SHIPWAY (Koolunga): I sent down two trucks of wheat through the Farmers' Union, and though the stationmaster was satisfied that the number of bags was as I gave it, two were lost. I did not mind the loss so much because sometimes a bag gets burst, but I could not find the empty bags. A fortnight ago we sent down a small coop of fowls—seventeen—and the return was only for fifteen. I think some inquiry should be made into this matter.

Mr. DALL: Not long ago we sent some pigs down, and I got word back that one was short. We were sure they were all trucked. We inquired to see if it was lost at the break of gauge at Hamley Bridge, but by-and-by it was found in the market. I believe the loss often occurs after the stock leave the railway.

Mr. DUNSFORD: The carcasses should be accounted for at any rate, and if we do not get the animals alive they should be delivered dead.

The motion was carried unanimously.

A Standard for the Sale of Chaff.

Mr. R. W. KLEINSCHMIDT (Woodside): Some time ago attention was directed to this matter, and a resolution was carried at a previous Congress affirming the desirability of having the standard weight of a bag of chaff fixed by legislation. I believe that the resolution was forwarded to the Ministry, and some time after (nothing having been done) they were questioned in the House regarding their intentions. As far as my memory serves me, the reply was that the session was then too far advanced to enable them to introduce the necessary legislation. Nearly two years have since elapsed and nothing has been done, while the need for legislation is as pressing as ever it was. It has recently been notified that action would be taken before long, but were led to believe that this was to be done long ago. I fail to see any reason why attention should not have been given to the matter before this, and I am convinced that if the Ministry realised the importance of the question it would have been done. Every country member must realise the necessity of something being done. There is no reason why the public and honest producers should be at the mercy of unscrupulous dealers. At the present a ton of chaff may contain either forty or fifty bags, or even a less or greater number, and the person who sells the maximum number of bags to the ton has an advantage. A nice little arrangement can be entered into between the chaff merchant and the salesman. The salesman can afford to sell a small bag for a less price than another can sell a bag containing a larger quantity, and as the purchaser takes it for granted that all bags are of the same weight, it is not unfrequently follows that one man does a larger and more profitable business than the other. Of course the public are being robbed in the meantime; but no one likes to be cheated out of their just dues, especially when dumb animals are concerned, and more particularly when it can be so easily prevented. The same necessity exists for regulating the weight of a bag of chaff as experience has shown to be necessary for a bushel of wheat, a bag of flour, or a loaf of bread, and it is a matter of surprise to every sensible person to learn that no such regulation

exists, or has been even attempted. The question should not require further consideration; it has been considered long enough. What is needed is immediate action, and I move that the Government be requested to introduce a Bill at the earliest possible opportunity to regulate the sale of chaff.

The GENERAL SECRETARY: The matter was not long ago brought again before the notice of the Minister of Agriculture, and he promised to see to it as soon as possible.

The motion was carried.

Vote of Thanks.

Mr. W. C. GRASBY: I have the pleasant duty, as the only member of the Central Bureau present, except the Chairman, to move a hearty vote of thanks to the Chairman, the General Secretary, and the speakers, who have all contributed to the very great success of this Congress. I regret that the members of the Central Bureau have not attended in such numbers as usual, but I have no doubt whatever that there are good reasons for their absence. The papers have been remarkably well written, and some of them have been quite equal to any that we have ever had before. They have been practical, and the discussions have been very useful. Some speakers have succeeded in saying very little in a great many words, but, as a rule, members, like the practical shrewd men they are, have said a great deal in a very few words, and the speeches, on the whole, have been of a very high order.

The motion was carried with acclamation.

The CHAIRMAN: I have been surprised at the large attendance, and I consider that the discussions in the Free Parliament to-day have been of almost as much consequence as any other matter we have had before us. We have tried to give everyone of you a chance to say what your opinions are on each subject, but the time at the disposal of the Congress was so limited that this has not always been possible. Still I think all the subjects have been pretty well ventilated, and we shall not hear many complaints from members when they go back to their Branches that they have not had an opportunity of making themselves heard. I thank you for the vote of thanks, and for coming to town to take part in the Congress, and I only hope you have all derived some benefit from it. (Cheers.)

The Congress was then dissolved.

CONTAMINATION OF DAIRY PRODUCE AND ITS CAUSES.

By G. S. THOMSON, N.D.D.

As the export butter season has opened, and promises to be an extensive one, the following remarks and illustrations should prove of value to the industry. The aim of all buttermakers should be to supply the home market with a prime product; but we must admit that the reputation of the buttermaker is dependent upon the care and attention of the supplier in providing the factory with milk and cream of a quality favorable to the production of well-flavored and good-keeping butter. Let suppliers thoughtfully review the responsibilities of managers in maintaining a good name for the factories and upholding their own reputation as capable men when they are daily handicapped with supplies of tainted milk and old and mixed quantities of cream. It is brought out in evidence that the manufacturer has to choose his choicest milk and cream when he competes for a butter prize at a show, and the buttermakers who exhibited at the recent Adelaide Show did not maintain their high standard of points without devoting particular attention to what success is chiefly dependent on.

The future success of our industry largely rests upon the milk suppliers; and we appeal to them for their combined efforts to minimise what this paper will show are the chief causes of failure in the manufacture of prime butter. It must be understood that situation of dairy factories, equipment and machinery, and intelligence and proficiency of factory hands are of little consequence when the raw material is deteriorated. It must be admitted, however, that some circumstances and conditions prevail against the quality of produce which the South Australian dairy farmer is not responsible for, but whatever they amount to there is more reason for the milk suppliers to be careful in the treatment of their products.

The prevalence of weeds having a taint-producing effect in milk is very common in certain seasons of the year, and it may transpire that certain taints in butter and cheese which are attributed to bacterial life are the outcome of plants digested by the cow.

From a want of knowledge of the causes of injurious changes in milk and cream the owners of dairies neglect to enforce thorough preventive means of reducing the sources responsible for the contamination. It may be inquired "What can we do to further the keeping quality of our milk and cream before it leaves the farm?" The answer is an ever-heard one—Keep out foreign matter and adopt aeration, and to convince the practical mind with regard to the "germ theory," I have prepared a number of bacteriological photographs, which have been taken from specimens obtained in cowyards, milkrooms, and factories. The presence of foreign matter in dairy produce is accountable for losses which cannot be estimated, but we know that South Australia loses thousands of pounds per year, and it needs no comment, as the uninviting appearance which many cowyards and milkrooms present to the visitor to prove the sources and extent of the contamination.

Where Injurious Germs are Found.

Germ life is found wherever organic matter and moisture exist. Different injurious species of organisms impart to our produce special offensive flavors. Some are not detrimental when kept in check, being otherwise useful in what they manufacture, but they prepare the way for other organisms that are productive of destruction and taint. The majority of these taint-producing germs common to dairy produce find a suitable environment for their multiplying power in insanitary milking yards, on the teats and udder of the cow, in the milk and separating rooms of the dairy farm, in impure water used for washing butter, and in utensils which are not effectively cleansed and scalded. They accompany the particles of dirt in enormous numbers, and in milk the germs multiply with such a rapidity that they can taint a can of milk in the course of a few hours. We do not so much fear the varieties that turn the milk acid, but what we dread are the kinds that make the milk stale, bitter, and otherwise unpleasant to the smell and taste.

Conditions Favorable to Germ Life.

In many respects germs are like the higher plants: they develop more perfectly and rapidly when grown on certain foods, and when kept under certain conditions of temperature. The principal food used in these illustrations is known as "agar," which is prepared from Japanese seaweed. When some species of germs are sown in this substance they require nothing more than heat and air to make their growths (colonies) visible to the naked eye. Their presence is well brought out in the photographs of plates and tubes given in the article.

Sowing the Organisms.

In preparing for the examination of milk, cream, butter, or water, the first step is to sterilise the glass plate. A tube containing congealed agar is melted by heat and cooled to a certain temperature. A drop of the substance to be examined is added to the agar, and the tube is well shaken to mix the germs thoroughly. The content of the tube is poured into the plate, a glass cover is placed over it, and it is then removed to an incubator, and kept there at a temperature corresponding to the heat of milk in the pail after milking. In the examination of air the culture media (germ food) is poured into the plate, when it is ready for exposure.

Dirty Udders and Unclean Milking.

Many people disbelieve in what science is "battling" to teach the dairymen on the subject of germ life. I will illustrate what was done to prove that no contradiction can be given to what is already well known in scientific dairying:—Procuring a few sterilised tubes and plates, the latter ready for sowing, I proceeded to a local dairy in company with the chief sanitary inspector for the city. On our arrival the owner of the dairy was busily engaged milking the cows, and to all appearance a good opportunity of securing descriptive bacteriological specimens were in evidence from the uncleanly conditions of the cows and milker. Selecting a cow, I proceeded to dust the udder free from the large particles of dirt and adhering pieces of straw before exposing the plates. When the udder appeared somewhat clean I held one of the plates immediately under the cow's udder for forty seconds, and after a lapse of ten seconds, a second plate was exposed to the finer particles of dust for one minute. The plates were cultivated, and two days after sowing both were photographed.

No. 1 and 2 represent the colonies of germs. No. 1 shows distinctly a number of hairs which had fallen from the cow's udder, and along their lines, there is seen an accumulation of bacterial life. Before these plates were exposed to the falling dust their photographic appearance would compare to No. 5; likewise with all other plates previous to cultivation. Not only were the udders and teats of the cows dirty at this particular dairy, but the milker had acquired that abominable practice of dipping the hands into the pail at short intervals during the process of milking; in other words, the teats of the cows were undergoing washing, which certainly caused serious contamination of the general milk supply and considerably reduced its keeping qualities. To reproduce evidence of this injurious practice I filled one of the sterilised tubes with a quantity of milk from a pail which was set aside, and which represented the yield from one cow. A second tube was partly filled direct from another cow by the milker while engaged stripping. An idea of the extraordinary number of germs in these samples will be entertained when it is known that one drop of milk in each plate has grown into these numerous colonies. No. 3 is from the milk pail; No. 4 from the dirty strippings. The dirt in the strippings came from the hand of the milker.

A convincing evidence of contamination in milk is shown when suppliers' cans are examined at factories on delivery of the milk supply. It frequently occurs that the surface of the milk in the cans is discolored with particles of dirt, pieces of straw, hairs, and other forms of foreign matter, and further proof is found in the accumulation of collected dirt in the milk strainer.

From what has been said, and from the illustrations given, readers will be convinced as to how milk is injured during milking, and every one will agree that this can be avoided by introducing a system of brushing the udders of the cows and allowing the dust to subside before milking, and by enforcing care and cleanliness in this very important duty allotted to the

milker. It is recommended to wash the udders of cows when brushing is ineffectual, but the teats should certainly be washed and dried before milking commences.

Sterilised, Acid, and Tainted Milk.

Milk in the udder of a healthy cow is said to be free from germ life; that is to say, no colonies would be seen in a plate culture. The first milk or washings out of the teat ducts, however, contain many bacteria, the middle milking fewer in number, and the last milking none. It is true in every day practice that it is impossible to obtain milk free from organisms, and in the summer weather acidity is extremely prevalent, and causes losses to the farmer and the factory owners.

To prevent the speedy formation of acid and thereby extend the keeping properties of milk the system of pasteurisation, or scalding, is adopted, and in some cases the milk is boiled until sterilisation is reached, when microbe life is said to be entirely destroyed. Milk sterilised by heat, however, is not recommended for dietetic purposes, and it is not a digestible food to be given to infants daily.

No. 5 is the appearance of a plate sown with a drop of sterile milk. There is not one colony to be seen. Had the milk been scalded, some forms able to stand the scalding temperature would have made their appearance.

Acid Milk.

In using the word "contamination" it does not apply scientifically to acid milk. In Cheddar cheese-making a degree of acidity in the milk is essential to the manufacture of a good cheese, but it frequently happens that what is delivered to the factories in the above condition is not without the presence of some taint.

The following experiment was conducted to show the value of care and aeration in the treatment of milk compared with want of attention in this particular duty. At a dairy farm near town a cow was milked in a careful manner, and at the close of the operation the milk was aerated by means of a common Lawrence cooler and run into a can that had been previously scalded and cooled down. Immediately after aeration was over the can was covered with a damp muslin cloth and removed into a clean and warm dairy, where the milk was allowed to become acid. To show that injurious germs were not abundant in milk treated in such a beneficial way a plate culture was made and the colonies microscopically examined. No. 6 shows the organism growing in numerous little specks. They all belong to the lactic group, which flourish in ripe milk and cream, and principally by their action the good flavors in both cheese and butter are produced. To give an illustration of an opposite kind a quantity of milk was taken from a supplier's can on a Monday morning. The milk was not acid to the taste, although it was otherwise unpleasant. A plate was prepared and a drop of the milk cultivated, with the result shown in No. 7. The appearance of mould will be seen in this example which tells us that the milk is a carrier of this fungus to the butter, similar with cream. Mould in cream and butter will be referred to later on in this paper.

Cream.

The question of cream interests the buttermaker most, as the quality of the butter which he manufactures depends upon the bacteriological purity of the cream churned. It must not be forgotten that the value of cream is greatly dependent upon the purity of the milk and that tainted milk cannot produce ripe cream of a fine and delicate aroma.

In separating milk every precaution ought to be exercised to have the working parts of the machine perfectly clean, and to accomplish this it is imperative to take the separator to pieces at the close of each working and wash and scald the bowl and its accessories.

A.



Culture from dirt off milker's hand.

B.



Culture from dirt off milker's hand.



Stab culture of mouldy butter from cream D.

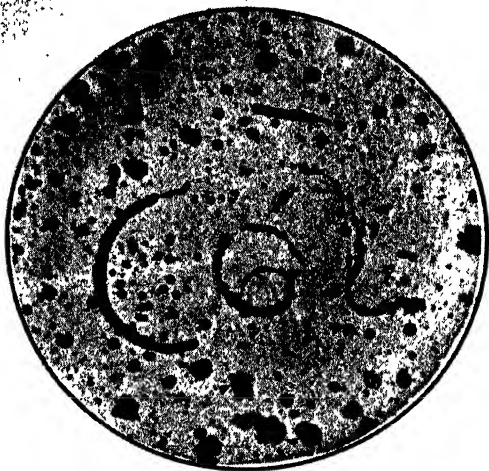


Culture from mouldy cream.

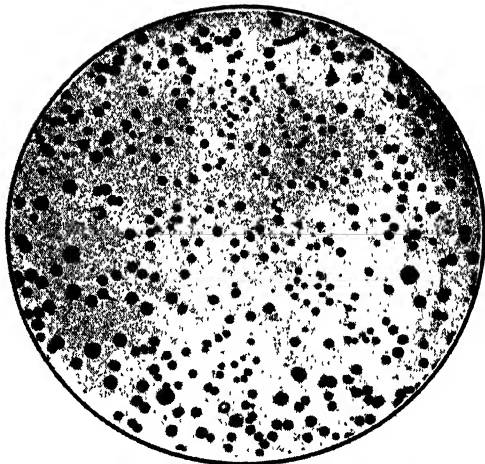


*Stab culture from pastry butter,
showing germ growth without mould.*

No. 1. — Dirty udder, showing growths around hairs. Larger colonies are from scales and dust. Exposure of plate, 40 seconds.

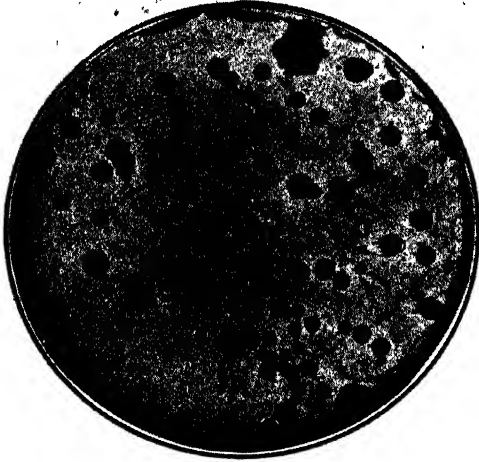


No. 2. -- Colonies from the same udder after exposure of a second plate for 60 seconds.

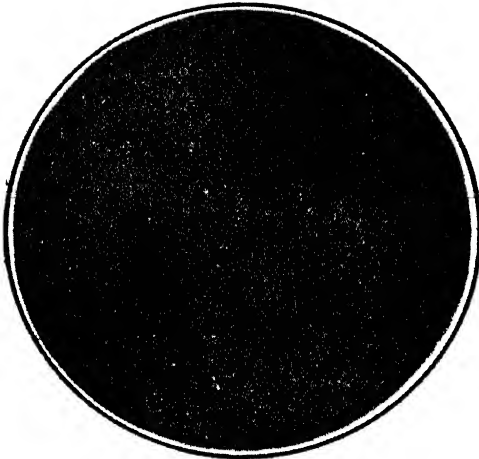


No. 3. — Freshly-drawn milk contaminated during milking. Colonies of germs from one drop of milk.





No. 4. — Milk-strippings contaminated during milking. (One drop.)



No. 5. — Sterilised milk. Free from colonies. (One drop.)



No. 6 — Acid milk, showing very early appearance of lactic acid colonies. No injurious organisms. (One drop.)

In many places it is customary while separating to collect the cream into 10 gall. tins before sending to the factory. This practice is very often accompanied with deterioration in the cream and loss in the quality of the butter manufactured, more especially when farms are situated at inconvenient distances from stations and factories, when the number of cows kept necessitates many collections to fill a can. In such instances cream should be sent away as often as it is at all convenient and in small lots.

I may mention again that the flavor of butter is chiefly dependent upon the flavor of the cream and that produced by the acid-forming organism. Tainted cream follows the activity of the injurious varieties.

Sterilised, Acid, and Tainted Cream.

The appearance of a plate sown with sterilised cream is given in No. 8.

When cream is carefully collected and ripened, the acid-producing organisms take possession of the cream and kill others of a hurtful kind. In Denmark over 95 per cent of the factories scald their cream, and then add pure cultures of germs to bring on ripeness. By this method the Danes have obtained uniformity in the general quality of their butter, and to this they owe their renowned position in the home markets.

Plate No. 9 is from cream ripened with a culture. The germ colonies were examined and no traces of any injurious organism were found. When cream is separated into one can twice daily and this continued for a number of days no longer do we find a predominance of the ripening organisms which inhabits every clean and well-kept dairy; but many injurious foreigners make their presence apparent in the production of taint.

Plate No. 10 was prepared from a sample of cream obtained in a town factory. Complaints were made of the tainted condition of the cream, and the examination showed that weeds were not accountable for the bad flavors.

Insanitary Milk and Cream Rooms.

Places used for the purpose of storing milk and cream very often afford abundance of floating dirt in the air. When cans are left unprotected the dirt and mould fall into the milk or cream with a certain injurious effect. Separation and cream ripening is frequently done in the same room, and very often the place is utilised for the storing of general lumber as well as butcher's meat and vegetables.

Plate No. 11 was exposed to the air of a badly-kept room for ten minutes. The colonies of germs are numerous, and mould in wavy lines is present over the greater portion of the specimens. It will be readily gathered how easily it is for our export butter to become mouldy, also cheese, when such conditions are permitted to exist where milk and cream is stored in neglected dairies.

Good and Bad Butter.

We know that good butter is manufactured from well-ripened and sound cream. This is demonstrated in the examination of the butter manufactured from cream No. 9. Plate 12 illustrates the colonies of lactic acid organisms. Plate 13 was grown from butter made from cream 10; and the flavor of this sample of butter was decidedly bad.

Impure Water for Washing Butter.

This question has been touched upon in another article in the *Journal*, and it is to be hoped that attention will be given to the sources of all factory water supplies.

Plate No. 14 is taken from a sample of water at a factory, and No. 15 is also from another butter factory. The first is almost pure, few colonies being present, while the latter is a mass of germ life accompanied with mould.

Tube Cultures.

In preparing these cultures the media or food is already in the tubes in a jelly condition, ready for the reception of the organisms to be studied.

In inoculating the tubes a sterilised needle or platinum wire is brought into contact with the substance undergoing examination, and when a smear culture is desired the surface of the wire is carefully rubbed over the media in the tube.

A and B are growths from the colonies in plate No. 4. C is a stab culture of butter made from cream D; mould is growing abundantly in this tube. D is a culture from mouldy cream. E is a stab culture from pastry butter.

Colostrum.

"Colostrum," or "beastings," are names applied to the milk secreted by the cow immediately before and for some time after parturition.

The composition of colostrum usually changes quickly after the birth of the calf; but before the milk is suitable for butter-making from five to fourteen days must elapse, and in some cases a longer period has been found necessary. The first milk should be given to the calf, as it contains a medicinal property having a desirable action on the intestines. The color of colostrum is very objectionable, but that is not the worst feature. The flavor is so pungent that $\frac{1}{2}$ gall. of cream is sufficient to destroy the aroma of butter manufactured from 10 galls. of sound cream. The addition of that small quantity to effect a change will explain what the result can be when 3 galls. or 4 galls. are added to an ordinary churning.

Throughout the past two months new milk has been extensively used, and this has come under my observation when testing export butter at the Government depôt. Some consignments were discolored in patches throughout the body of the butter and the flavor was of the most objectionable kind. When the analysis of colostrum is compared with normal milk a marked variation is in evidence, more especially with the albuminoids, water, and sugar constituents. It is through the excess of albuminoids and the presence of corpuscles that make the milk so injurious.

The following is the analysis of colostrum and normal milk :—

COLOSTRUM (<i>Engling</i>).		NORMAL MILK.	
Water	71.69	.....	87.5
Fat	3.37	.....	3.5
Casein	4.83	.....	3.5
Albumen	16.85	.....	0.25
Sugar	2.48	.....	4.5
Ash	1.78	.....	0.75

For cheese-making the dangers are greater, and in no case ought milk to be sent to the factory before the eighth day from the calving of cows; otherwise decomposition will be forced in the cheeses when maturing.

Microscopic Appearance of Colostrum and Normal Milk.

In No. 16, *a*, *d*, and *e* are cells which have lost their membranes; *b* and *b* represent cells with large drops of fat; *c* is a cell with a partially destroyed cell membrane; *h*, cells with nuclei.

No. 17, *a* is large globule of fat; *b*, small globule of fat. All that is seen are fat globules.

Colostrum corpuscles are the characteristic bodies seen in new milk. They are said not to disappear until three weeks after calving. In No. 16 the corpuscles are magnified 300 times and are four or five times larger than the ordinary milk globules when similarly magnified.

The normal milk shows the particles of fat of varying size. The size differs in the milk of dairy breeds and individual cows. They are larger in the case of the Jersey, Guernsey, and Shorthorn, and smaller in the milk of the Ayrshires, and that is the reason why the Ayrshire is characterised as the best cheese cow.

Detecting the Presence of Colostrum.

When colostrum milk is left to stand it has a tendency to separate into two layers. The action of rennet is slower than in the case of new milk. It is curdled by heat when the albuminoids will have formed a thick skin on the surface of the milk. The greatest characteristic of colostrum are the clusters of cells which are detected by the microscope.

Microscopic Appearance of Bacteria.

No. 18 is organisms common to sewage water; 19, lactic organisms; and 20 are pathogenic germs and corpuscles found in milk; 21 and 22 are specimens of mould. In all the plates of colonies, except 5, 6, 8, 9, 12, and 14, injurious germs were isolated.

GRADING BUTTER AND ITS EDUCATIONAL VALUE.

BY G. S. THOMSON, N.D.D.

The system of grading butter at the Government Dépôt is receiving general appreciation from the factories. The work is conducted as follows:—On the arrival of each consignment of butter a number of boxes, according to size of consignment, are removed into a cool corridor. These boxes are opened on a day set apart for the testing, and each is carefully examined and the results noted in a book specially arranged for the purpose. The heading on the pages of the book records the name of the steamer the butter is to be shipped by, date of examination, name of exporter, brand of boxes, number of boxes, grade (whether “approved,” “not graded,” or “pastry”); and this is followed by the maximum points given for flavor, texture, color, salting, and packing. To avoid error the man in charge of the butter at the dépôt makes entries in a book of a similar description—but without points—having in addition date of arrival of the boxes, condition when arrived at dépôt, and shipping marks.

The defects of the butter are noted in spaces provided in the grader's book immediately below each scale of points. The complete examination is copied into special forms, with notes and suggestions given for future treatment, and this is posted to every buttermaker exporting by each English mail. In the examination book an asterisk is put opposite each factory that has noted the suggestions given and have rectified the errors in their future shipment. The examination records are finally copied into a large book, which is kept in the office for reference. By this means a complete account of the butter is in the hands of the department from the condition of the boxes as they reach the dépôt until the butter is chilled and put on board the steamer. Temperatures are carefully taken, and in case any of the test boxes should be selected on the steamer as an average of the temperature of the shipment and found to be a little high, a special mark is put upon each box. This provision was suggested by Mr. Kennedy, the chief engineer at the dépôt.

The Acidity Apparatus in Factories.

It is encouraging to state that eight factories are now in possession of the acidity apparatus. Out of that number seven of the managers will work the test throughout the process of cheese-making and the eighth will use it for cream and milk testing.

As a means of assistance to the managers I have prepared printed forms, which can be filled in as each examination is made. The cheese forms will record the percentages of acid at the different stages in the manufacture, and will be of immense value in assisting makers to turn out a product of a uniform quality. In conducting the milk tests a weekly record of the acidity of any milk supply can be ascertained from a glance at the daily percentages of acid noted in the special form provided; also provision has been made in a third paper for use in testing cream for ripeness in butter-making, and which can also be employed in checking cream supplies.

Having had considerable experience in the use of the above apparatus while cheese and butter making in England and other parts, I can with confidence testify to its reliability when carefully manipulated. During the past year I have used the instrument in making over 500 milk and cream examinations in laboratory work, and find it of great help when testing for the presence of acid preservatives.

Readers will find an explanation of the construction and parts of the apparatus and how to work it given in the *Journal of Agriculture* for September, 1898, and December, 1899. It is to be hoped that before long every factory in the colony will be able to bear testimony to its usefulness.

Government Butter Tests.

Buttermakers would do well to read over the reports on the Government butter tests published in the *Journal of Agriculture* for January, 1900, and, along with other remarks of importance, note what is said about casing, packing, and salting. Boxes with 58lbs of butter and over that quantity were found to number five out of the eighteen lots examined. This would mean a considerable loss to factories if consignments of over weight were of common occurrence. Observe that preservatives to the extent of 10ozs. to the 100lbs. of butter proved beneficial to the keeping quality.

Factory Water.

In an article on "Fishiness in Butter," printed in the May number of the *Journal*, an account is given of the bacteriological purity of milk and water, which is a matter of very great importance and worthy of strict attention. Out of fifteen samples examined only two were extra good, two were good, three fair, six low, and two very low. When we consider that a large quantity of water is used to wash butter grains free from buttermilk, impurities in the water cannot fail to be otherwise than injurious to the quality of the butter.

Government Test of 1900.

This year another test is in progress; but, unlike the last, no prizes are offered. The sole desire of the department is to investigate the causes of butter taints, which have been prevalent in the past. With this end in view, two factories in the colony have been selected to manufacture the butter—one situated in the North, the other in the South-East. The climatic conditions in the two districts are different, likewise the quality and extent of the herbage, which will afford room for comparison in the practical and scientific tests. Each factory will send to the dépôt for examination four boxes of butter

monthly, two to be made on a day selected in the first week of the month and two in the last week of the month. Cream from separators at a distance from the factory will be used in some instances, and cream from Monday's milk in other cases will be separated and churned. Samples of milk, cream, and water will be bacteriologically examined, also the butter before and after refrigeration, which will be over a period of four weeks. The butter will be brought under steady and varying temperatures throughout the testing in order to find out the influence of these changes. The test, which began this month, will continue until the end of December.

A SUPPLIERS' PROBLEM.

By G. S. THOMSON, N.D.D.

The following observations will be of use to every buttermaker, as they show how the butter ratio of cream is lowered:—

1. By breed, health, and period of lactation in cows.
2. *Changes of Food and Condition of Weather*.—A change from dry to succulent food will alter the quantity and quality of milk yielded. Abundance of water to cows after intervals of thirst in hot weather will quickly change the fat percentage. A speedy fall in the temperature of the air will reduce the percentage of fat in the milk.
3. *Ill-treatment of Cows before, during, and after Milking*.—Rough milking and unkindness will cause at once a fall in the quantity and quality of the milk.
4. *New Cows coming into Milk*, the percentage of fat will be lower.
5. *Efficiency of Milkers*.—When cows are well stripped one time and neglected another the fat yield will change very much. The first milk may contain as low as 1.5 per cent. of fat, while the stripping may be as rich as 12 per cent.
6. *Temperature of the Milk when Separated*.—When low in temperature the separator skims less efficiently.
7. *Consistency of Milk at Separation*.—When evening's milk is mixed with the morning's in cool weather and separated without being heated, loss in cream is sustained; also, when evening's milk is kept overnight in hot weather and heated or mixed with the morning's, the risks are greater. Such milk ought to be separated by itself, and in a cold condition if the slightest acidity has developed.
8. *Working Efficiency of the Separator*.—Some machines are unreliable, the result of damage caused by shaky foundations. The speed of the separator and regularity in the number of the revolutions of the bowl affects the percentage of cream; also the quantity of milk passed through in a given time does likewise.
9. *Heating of the Bowl with Warm Water*.—Neglect to do this will cause loss of cream, as it may adhere to the discs of the Alpha separator and become washed into the separator milk.

Very Important Causes.

10. *Percentage of Fat in the Cream*.—The best results are got from cream containing from 25 per cent. to 30 per cent. of fat; beyond 40 per cent. of fat the losses are considerable.
11. *Mixing the Cream*.—Sweet cream mixed with sour cream and churned shortly afterwards will result in loss of butter.
12. *Age of Cream*.—Over-ripe cream usually gives up its fat too rapidly, and quantities are lost in butter-making.

13. *Excess of Preservatives, including Salt*, will lower the butter ratio, and altering the separator screw will certainly cause losses.

14. *Distance Carted to the Factory and Transmission on Railway*.—The time taken for cream to reach the butter factories in the city in many instances is over twelve hours. When the cream leaves the farm fully ripened, and arrives at the factory after many hours of shaking, a percentage of the fat will not be given up to the formation of butter. Again, in hot weather a quantity of the cream will be partially, and some of it completely, churned into butter of an oily consistency, and which is generally lost in the buttermilk.

15. *Exposure of Cream to Excessive Heat* during transit, either on its way to the country factory or at stations and in wagons or vans, will cause a fall in the percentage of butter. When ripe cream is overheated, after chilling reduces the risks of loss to a great extent, but the butter ratio is still lower than carefully-ripened cream which has not been overheated.

16. *Quantity of Cream in Cans*.—When cream cans are not properly filled the concussion is greatest, and churning takes place during transit of the cream to the factory. In the winter weather long transmission and shaking is known to cause "sleepiness" in cream.

Losses in Butter-making.

1. *When Mixed Creams are Churned together*, and when thick cream is churned undiluted with water. In churning acid and sweet cream together naturally the acid cream will give up its butter fat first, to be followed by the sweet cream, but the buttermaker ceases churning when small grains of butter are obtained; hence a quantity of the sweet cream passes away in the buttermilk. Churning sweet cream alone also reduces the quantity of butter.

2. *Churning at a High Temperature* leaves the buttermilk rich in fat. Most factories are provided with refrigerating machinery, and loss through the above is avoided. Cream churned at too low a temperature will also cause loss.

3. *Kind of Churn*.—Experiments favor the box pattern, especially so in hot weather.

4. *Speed of Churn and Period of Churning*.—A high speed and quick churning reduces the butter ratio.

5. *Want of Cold Water in Hot Weather* causes loss of fat.

6. *Churning into too fine Grains* and overwashing lowers the quantity of butter.

Fat in Buttermilk.

The percentage of fat in buttermilk varies according to the conditions of the cream, which have already been referred to. Fleishmann, in his "Book of the Dairy," states that the percentage should not be higher than 0.8, and 0.5 to 0.6 is a general percentage. Warrington gives 1.1, Storch 0.31, Vieth 0.50, and Richmond, in his recent work on "Dairy Chemistry," has found the amount of fat to vary from 0.15 per cent. to 5.60 per cent., but it is rare to find as much as 2 per cent. Usually less than 1 per cent. may be considered satisfactory; but if sweet cream is churned it is difficult to always keep within this limit. "Any percentage above 2.0," says Richmond, "must be considered unsatisfactory, and the cause should be inquired into."

During the Government butter prize test of last October I found the following percentages of fat in the buttermilk sent from factories competing:—0.175, 0.2, 0.2, 0.2, 0.25, 0.3, 0.3, 0.3, 0.4, 0.5, 0.6, 1.4, 1.4, 3.2, and 3.8.

TO KILL PLANTS of any kind, cut them down close to the soil, and at once dose them with a little of the following solution:—Boil any quantity of water likely to be needed; whilst boiling add for each gallon 2½ ozs. white arsenic and 1½ ozs. of washing soda; stir till dissolved, and apply when cold.

CONSTITUENTS OF VARIOUS CROPS.

The following information was given by Dr. William Saunders, Director of Dominion Experimental Farms, Canada, before a Select Committee on Agriculture, &c., on March 21, 1900, and may be useful to farmers wishing to study the principles of fertilisation of soils.

Crops consisting of the following products, for each acre of land, were found to contain on an average :—

Crops.	Quantities.	Lb. Nitrogen.	Lb. Phosphoric Acid.	Lb. Potash.
Wheat.....	24bush. grain, 2,200lbs. straw	40·53	17·64	19·11
Barley....	35 “ “ 2,000 “ “	45·48	17·14	28·25
Oats.....	50 “ “ 2,200 “ “	46·3	15·22	32·88
Maize.....	15 tons silage	87·00	49·40	98·10
Turnips.....	15 “ roots	49·60	27·90	82·25
Mangolds....	15 “ “	45·45	27·60	114·90
Carrots.....	15 “ “	35·25	33·30	97·95
Sugar beets.....	15 “ “	71·85	25·80	135·90
Potatoes.....	200bush. tubers	25·20	8·40	38·80

INSPECTION AND SAMPLING OF FERTILISERS.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

During the proceedings of the Agricultural Bureau Congress a member moved that the importation of fertilisers should be undertaken by the Government in order to ensure purchasers receiving the quality of fertilisers they pay for, in other words, to do away with the opportunity of fraudulent practices on the part of importers. As the mover pointed out, the time that would be lost, and the trouble and expense which would be involved by the farmers having their purchases analysed, practically makes such action impossible, and it was therefore the duty of the Government to protect users of fertilisers. Knowing that the motion to a certain extent voiced the feelings of a number of members of the Bureau and others, and having no opportunity of referring to the matter at the Congress, I propose to show that the steps taken by the department are sufficient, with the co-operation of purchasers, to detect any attempted fraud on the part of the importers. In justice to the importers, however, I must state that I have never had the least complaint to find against them. On the contrary, each one affords me every facility for obtaining samples for analysis, and they are so confident of the result that they look to the publication of the analyses as an advertisement for their fertilisers.

Last year the various importers advised me of the names of the ships carrying fertilisers for them, and I have no doubt they will do so again this year. Whenever any vessel bringing fertilisers arrived, I took the first opportunity to ascertain when they commenced unloading, and then visited the ship and took the necessary samples. With sailing ships this work was usually done in the hold of the vessels, and with steamers, on the wharf. The method adopted in taking samples is as follows:—From twelve to twenty bags taken from different parts are opened, a trier inserted, and a column of the fertiliser about 2in. in diameter for a depth of 9in. to 12in. in the centre of the bag is removed from each. This is placed on a cloth, the whole thoroughly mixed, and then divided, one sample being used for analysis, one retained by myself, and the other by

the importer. Out of about fifty-six shipments which arrived last season, I obtained samples in the manner described from all but six, and in each case there were small lots of brands of which I had already obtained one or more samples. It will therefore be seen that to all intents and purposes the imported fertilisers are tested in bulk.

The question as to possibility of adulteration after arrival is very easily settled. Of the imported supers., 90 tons out of every 100 tons goes direct from the ship into the railway truck or coasting vessel. The fact that the importers lose several shillings per ton on every ton they take into store causes them to store as little as possible. Apart from this, it would be practically impossible to adulterate the fertiliser on a scale of sufficient magnitude to pay without the same being detected, as a large store and much machinery would be required. Most of the Thomas phosphate is taken into store, but anyone who has handled this material will laugh at the idea of adulterating it after it is once bagged.

I do not wish it to be inferred from this that I consider it unnecessary for purchasers to exercise reasonable precautions when purchasing fertilisers. I have repeatedly called attention to the careless way in which they often place themselves in the hands of the vendors, and it is sufficient answer to the statement made by one or two members of the Bureau, that none of the firms were to be trusted, that, under the circumstances, there has been so little cause for complaint. Nor do I intend to infer that the present legislation is sufficient. Too much depends upon the honesty and fair dealing of the importers and manufacturers, but the Hon. Minister of Agriculture has stated that an amending Fertilisers Bill will be introduced at an early date, and when it becomes law I am confident the causes for complaint which now exist will be removed.

Although I have no hesitation in saying that last season all the imported fertilisers arrived in a satisfactory condition, I regret I cannot speak similarly of some of that manufactured locally. The condition in regard to certain small mills round Adelaide is far from satisfactory, not only to the users, but also to the honest dealers. On this point I may mention one or two instances. Many growers are complaining that the price of bonedust has gone up to a considerable extent. I have no hesitation in saying that the growers have only themselves to thank for this. The demand for "cheap" manures induces certain people to mix various adulterants with the bones in crushing them, and they are naturally able to sell cheaper than the man who sells the pure article. In order to obtain supplies of bones, they offer increased prices for the raw material, causing the other manufacturers to do the same. As the price of bones goes up, so does the price of pure bonedust. During the past twelve months the price paid for bones round Adelaide has increased to the extent of 17s. 6d. to £1 per ton, and local bonedust is now about 10s. per ton dearer than it was last year. If users of fertilisers would be content to pay a fair price for their requirements, and deal with firms of good standing, they would run little risk of being imposed upon. I know of more than one make of bonedust which contains from 15 per cent. to 25 per cent. of added worthless matter, and this is bought by market gardeners simply because it is 5s. to 10s. per ton lower in price than a first-class article. Then, again, only during the past few weeks I have obtained samples of a fertiliser manufactured by one of the firms of which I complain, the outside value of which is £2 per ton, whereas the price obtained is £4 10s. A name similar to that of an established brand is adopted, and the price fixed a few shillings lower. It may be said that my remarks on this matter are too severe. My answer to that would be that if there was no demand for cheap and, consequently, inferior manures, the manufacturers would soon have to cease operations.

If I may be permitted to advise farmers on this important matter, I would say—(1) Deal only with respectable firms who have a reputation to lose; (2) order early; (3) do not place too much reliance on the statements of canvassers concerning the merits of different brands; the pages of the *Journal of Agriculture* of the past two years contain all the official analyses of fertilisers, and can easily be referred to; (4) do not accept mere verbal statements from agents as to guarantees of fertilisers; (5) do not allow the fact that one brand of super. has analysed 38 per cent. of water soluble phosphate as compared with 37 per cent. in another brand to carry much weight: there may be other things to counterbalance what after all is a difference scarcely worth taking into account; (6) do not sacrifice quality for cheapness; and, finally, do not forget that unless the inspector has the assistance of the purchasers he cannot do his work as efficiently as might otherwise be the case.

FARM HINTS FOR OCTOBER.

By THE EDITOR.

Those who intend to make hay should read the paper by Mr. H. A. Davis, of Riverton Branch Agricultural Bureau, as read at the late Congress in Adelaide, and printed in this issue of the *Journal*. The best hay for farmers' own use is made when the grain is in the early dough stage, but for sale it must be cut earlier, because stablemen regard green color as essential. Do not leave the hay too long exposed to the weather, as it will bleach and lose a good deal of its valuable properties. Do not omit to properly thatch the stacks at the earliest moment. Piling a lot of loose straw on top is no protection against bad weather.

Milletts of all kinds will do better if sown during this month than when sown earlier. The name "millet" applies generally to *Panicum italicum*, *P. miliaceum*, *P. germanicum*, and a number of other Panic grasses, but is often applied to various sorghums, setarias, to the canary seed (*Phalaris canariensis*), and even to maize. The treatment for all of the millets, sorghums, holcus, and varieties of maize is similar where good crops are sought. The soil should be light, deep, rich, and thoroughly well prepared. The seed should always be sown in drills sufficiently wide apart to allow of full development of each plant, and the surface must be maintained constantly in a loosened condition by aid of the hoe, worked either by horse or hand. Unless these conditions prevail there can be no certainty of a crop.

Lentils will grow in many places, and should give a paying crop. It is the oldest known farm crop, as it was cultivated to make the red pottage with which Jacob alienated Esau's birthright. Those who use lentils as a principal article of diet cannot suffer from dyspepsia, on account of the large percentage of digestive pepsine contained in the seeds. The straw is very useful for live stock, and the decorticated seeds are ground into meal, which is sold as revalenta and ervalenta—names derived from the botanical name of the plant (*Ervum lens*).

Sow maize as soon as possible on a portion of the fallowed land. The crop will be very useful for cows and other stock, either as cut or made into silage. Sow in drills 2½ ft. x 2½ ft., 1½ in. deep; roll at once. Seed does best after being soaked forty-eight hours. Rows may be 3 ft. x 18 in. Very frequent shallow cultivation is necessary to ensure a good crop.

Holcus and sorghum of all varieties should be sown and treated as just recommended for maize, but the plants may be grown a little closer in the rows. As there has been a good deal of rain this season there will be almost a certainty of good crops when cultivated well on suitable soil.

Mangolds and other beets must be frequently hoed to stimulate growth. The

Globe and Tankard varieties of mangolds are most suitable for shallow soils, also beets. The long varieties should be grown on the deep rich soils. Beets and mangolds will thrive upon saline soils if not too wet.

Pumpkins and melons of all kinds grow best in light deep soil, rich in old decayed vegetable matter. This is why they thrive on new land. Plenty of old manure from the cowyard or sheppens may be mixed in patches with the soil to 1ft. depth, and seed sown in those patches, which should be 12ft. to 15ft. apart. Because many of the seeds may be barren it is usual to sow a dozen seeds in each patch and remove all but five or six of the strongest plants when they are in the fourth leaf. As the effect of the wind in blowing over the vines or runners of the plants is very injurious it is usual to sow cross rows of maize amongst the rows or hills, or else to stick in a good number of pegs or stakes with the same object. The roots extend very considerable distances near the surface, and therefore it is not safe to hoe or dig between the hills after the plants have started. The plants will not need watering if the soil is deep, rich, and light.

As buckwheat takes only twelve weeks to mature after sowing the first seeds, it is worth while to put some in on sandy or stony soil to furnish food for cows, seed for poultry, and nectar for bees.

There will be a deal of natural grass and herbage in some localities, whilst in others there will be crops that it would pay better to cut for ensilage than to leave for a hay or grain crop. Butter takes next to nothing away from the farm, whilst the hay or grain, if sold at usual prices, will remove nearly the sale price value of plant food from the soil. Pit ensilage is best for cows if not for other stock, and ensilage is easy to make either in pit or stack. In pits it is best chaffed. The stuff cut in the morning can be carted to the silo or stack in the afternoon, and the afternoon's cutting can be ensilaged next morning. Three feet to 5ft. or 6ft. of stuff will develop 130° F. within eight hours, and then more green stuff or weight must be piled on to press out the air and thus prevent rise of temperature above 145° F. Anything below 130° F. will fail to properly cure ensilage, and anything above 145° F. is likely to seriously injure it.

It is very important to remember that our indigenous grasses are chiefly annuals, that the last seven years have been very unfavorable to the production of seeds, that our domesticated herbivorous animals have eaten the herbage down so closely that there are now very few plants left to produce seeds. For these reasons it is necessary that a portion at least of each grazing paddock should be reserved to enable the plants to mature and produce seeds. It would most probably pay well to harvest seeds of the more valuable grasses and herbs for re-establishment of natural pastures. It is a strange commentary upon our "progressiveness" that our seedsmen are obliged to send to the continent of Europe and to America for seeds of Australasian saltbushes and other plants.

In the South-East sow peas, lucern, swedes, kohlrabi, mangolds, beets, and rape; plant potatoes.

Lucern requires deep, light, moist, level, well-worked soil, and absence of frost when first starting to grow. It will withstand slight frost when it has got a good hold. Half an inch deep, in drills 1ft. apart, 10lbs. of seed to an acre will give a good stand. It is advisable to roll the bed directly it is drilled, and harrow it when the plants have taken hold.

Rape requires very rich soil as a rule, but sometimes a good crop may be grown on wheat rich land if good spring rains should fall. From 3lbs. to 4lbs. of seed will sow an acre. It is best to drill it in at 18in. x 6in., or thereabout.

Sheep-shearing commences at end of September and continues until finished. The floor should be kept absolutely clear of straw, grass, chips, twigs, and pieces of string, &c. The lectures and papers by Mr. Geo. Jeffrey, published in the *Journal* give valuable hints which should be observed.

ORCHARD NOTES FOR OCTOBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The season thus far has proved highly favorable to the well-being of orchard trees. In all the fruit-growing centres abundant rains have fallen and few frosts have been experienced. It is not a matter for surprise that only a moderate bloom has been carried by stone fruits, as the trees have not yet recovered full vitality after the protracted drought. In those orchards, the owners of which have taken proper precautions to admit the rain to the sub-soil, and assuming such subsoils are fairly retentive, sufficient moisture should have been stored therein to carry the trees through the summer if proper tillage is maintained.

It may appear somewhat anomalous to hark back to the subject of conserving soil moisture at a time when springs and creeks are flowing and by-roads are like seas of mud. If the "uses of adversity" can teach our orchardists anything, the past seasons of drought should have impressed at least this one lesson upon them. Assuming the rain has penetrated the ground, efforts should be henceforth made to retain it there by checking evaporation, and this is best done by making the top layer of soil act as a mulch—a buffer to the ascending capillary moisture. A mulch is usually understood to be some foreign substance, such as manure, weeds, straw, chaff, &c., placed on the ordinary surface of the soil. This method checks evaporation from the space covered, but no further. This means, in a fruit garden, two-thirds to three-fourths of the surface would be left in a state which permitted unrestricted evaporation. This old style, though probably suited to cooler climes, has a most detrimental effect here. Evaporation beneath the mulch rings is checked at the ground surface, and, consequently, the roots seeking or following the moisture are drawn to the natural surface, where they are more liable to injury from drought, and they make cultivation, without serious damage to themselves, an impossibility. Contrast this with the modern system, which turns, by means of the harrows, the whole surface for several inches in depth into a continuous dry mulch. The moisture ascends to the bed of this mulch and the roots may follow it, but they stop at the loose dry earth, and are, therefore, prevented coming up to the surface to be damaged by cultivation or drought. This method of supplying the trees with moisture is natural and continuous. It does not act in the same spasmodic manner as water applied to the surface in the summer. Summer irrigation results in a series of checks and stimulations, and may be described as a veritable alternation of feast and famine. To secure the best results the cultivating implement used during the summer should only *stir* the soil and *never turn it or stand it up in ridges*. Turning or ridging increases the dissipation of moisture. Showers of rain consolidate the surface and increase evaporation by allowing the formation of definite capillary tubes. To counteract this, after each downfall the surface should be again stirred. Even without rain falling the surface should be stirred several times during the season.

The transplanting of citrus trees, passion vines, and guavas can be safely accomplished at any time in the spring. Young growth is now general upon these, and their removal usually results in its destruction. If, in moving the trees, the roots are considerably curtailed or mutilated, the tops should be cut back and the young shoots removed, as they will only wilt away if left. Plenty of water and protection from winds are necessary to the successful establishment of trees moved at this period. Given these and careful handling, no fear of losing any unusual percentage need be entertained.

A survey of the young deciduous trees planted in the past winter reveals many interesting items. The results of sections made in certain ways, the

growths emerging from the buds upon the stems or branches show all sorts of exceptions to preconceived ideas of what should occur. While making such observations the grower may still direct the young tree in "the way it should go" by judiciously disbudding it of such shoots as are undesirable in working out the shape found most appropriate. With most kinds of trees this should take practical form in separating the shoots which will form the main branches, so that each shall have room not for the present alone, but for future extension. "More light" in the literal sense is the crying need of every main arm, shoots, and laterals upon our fruit trees. If strong shoots tend to outstrip and rob their fellows their terminal sappy buds should be pinched out to administer a temporary check to the advantage of their weaker and less favorably situated comrades.

It may be necessary in early districts to thin stone fruits during this month. No definite rule can be laid down or specific advice given which shall apply to all kinds. The general vigor of each tree should be consulted and the quantity of fruit retained accordingly.

In late districts deciduous trees may yet be grafted by ordinary methods. Young suckers and shoots emerging below grafts should be controlled either by pinching, if considered desirable to retain any for drawing sap, or by complete suppression. Citrus trees are now in a condition for budding. Buds from rounded shoots taken off trees of proved value alone should be used. From buds inserted at this period good growth may be obtained immediately.

Pests are ever with us, and the fight against them must be constantly waged. On the plains codlin moths begin to emerge from their winter stages and deposit eggs upon the newly-formed fruits. Those who intend spraying with Paris green (1oz. in 10galls. of limewater) should begin as soon as the petals fall and the young fruits are visible. No time should be lost in cleaning tree stems and rubbish from near infested trees to destroy any remaining larvæ or pupæ. If old bandages are still upon the trees they should be removed and disinfected or burnt.

Attacks of peach aphides should be promptly suppressed by spraying with tobacco and soap wash or kerosene emulsion. The reason why this pest is so difficult to suppress is generally found in the fact that it has not been taken in time. The individual insects are easily killed, but to reach them the wash must be applied thoroughly at a time when they are few in numbers and not protected by dense foliage.

The black scale is spreading out upon the young growth of citrus trees, and as they are in a tender stage it is a good time to spray with kerosene emulsion or resin wash to destroy them. Before applying the spray the twig growth should be opened and thinned out to admit plenty of light and air. In some sections the curl leaf is showing freely upon peach trees. Practically no good is done by spraying the trees after the curled leaves appear, but Bordeaux mixture is an almost infallible remedy if applied when the buds are half expanded. In humid districts the apricot shothole should be averted by spraying with summer strength Bordeaux mixture after the fruits are well set (1lb. fresh lime, 1lb. bluestone, in 10galls. of water). The best results in spraying apple and pear trees for the suppression of the *Fusicladiums* (black spots) are obtained by using this mixture when the winter buds expand sufficiently to show the clusters of flower buds or leaves. The fungicide can then penetrate between the folds, and come in contact with spores, or coat the tender parts against the attacks of the fungus.

WATERPROOF FOR RICK-CLOTHS, &c.—Make a solution with water containing 20 per cent. of soap, and another solution with 20 per cent. of sulphate of copper. Saturate the cloth first in the soap solution, then in the bluestone solution, then wash and dry it.

NOTES ON VEGETABLE-GROWING FOR OCTOBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

On the plains country where water for irrigation is available the main crops of summer vegetables should be sown now. In the deep, secluded, cool gullies of the mountainous districts ordinary spring vegetables will be sown and planted as the ground dries sufficiently to be workable. For the general cultivator who does not aim at producing extra early samples for market, but rather for the supply of his own household, this month usually proves most favorable for making the first outdoor sowings of melons, beans, tomatoes, &c. All the members of the melon family thrive best in new ground rich in humus. New ground is seldom available, but the humus may be supplied to ordinary garden soils by burying large quantities of weeds or, better, by using thoroughly decayed barnyard manure or compost from a pit in which vegetable refuse has been rotted down during the year.

In fairly large operations these dressings have to be spread upon the surface and ploughed under. In small gardens round holes dug about 3ft. in diameter and 1½ft. deep, into which about half a wheelbarrow of manure or compost is placed, are usually productive of good results. It is not advisable to sow the seeds in the manure, but in the soil above it, and the manure should be well mixed with the lower soil. This will prove best for the present, as well as future crops of other kinds grown on the ground. From the following tried varieties the amateur may select to his own satisfaction. Among cucumbers Long Green, Rollison's Telegraph, Sion House improved, Japanese Climbing are well-known stock varieties. The small Gherkins should also receive attention from persons partial to pickled cucumbers. Watermelons: Cuban Queen, Kolb's Gem, Rattlesnake, Seminole, The Boss. Sweetmelons: Early Hackensack, Montreal Nutmeg, Victory of Bath, Delmonica perfecta. Pumpkins: Turks' Turban, Ironbark, Yellow Mammoth. Marrows: Long White, Custard, Tripoli Bush. Trombones: Green and white; the latter is lacking in flavor, and is evidently not a true trombone. Pie or Preserving Melons: Long Green, Long White, Royal George; the latter is about the best of the round green section.

Tomatoes can be sown in the open garden with perfect safety, providing the ground is well prepared and the sown spots sheltered. For this purpose the ground should be pulverised and a little well-rotted manure worked into the patches to be sown. After the seeds—say half a dozen—are sown, and covered very slightly with sifted manure to prevent the baking of the surface, water should be applied from a can with a rose attached to the spout. A pane of glass either laid flatly upon supports above the patch or stood obliquely on the sunny side will assist the young plants. The best way to raise tomatoes is to sow the seeds in small pots, boxes, or tins, and transplant the young plants out when they are small and sturdy. It is not wise to make the ground very rich with farmyard manure, as it tends to stimulate the growth of leaves to the detriment of the fruiting portions. Moderately rich soil of ordinary character is best for the production of early fruits. After the plants have set a fair quantity of fruits, dressings of superphosphates washed into the soil by irrigation will prove stimulating. The best stock varieties of tomatoes are Acme, Ruby, Large Red, Mikado, Dwarf Champion, and Volunteer; Ponderosa and General Garfield are well known but somewhat cumbersome fruits.

For the small grower there is no more profitable summer crop than dwarf or pole beans. Owing to the difficulty of obtaining poles and the obstruction they

offer to rough winds the tall climbing varieties are only successful under certain conditions. These plants require moderately rich soil which has been well and deeply prepared. It is a good plan to soak the seeds in hot water to soften the seed lobes and hasten germination before the soil hardens. This is satisfactorily done by pouring the hot water—not quite boiling—over the seeds and allowing them to remain in it for a couple of hours. Pour the water away, and allow the seeds to remain untouched for an hour or so to toughen; otherwise the handling necessary in sowing them will break the lobes asunder and destroy the germs. Sow the seeds in drills, dropping them about 4 in. apart. They should then be covered with about an inch of pulverised manure—dry loose stuff will do—into which a sprinkling of superphosphate has been mixed. If the ground is not quite wet a watering should be applied at once, and under ordinary circumstances no further irrigation will be required until the plants are well above the soil. The best varieties of dwarf beans are Canadian Wonder, Emperor William, Best of All, Caseknife (dwarf), Negro. The well-tried climbing varieties are White Caseknife, Scarlet Runner, White Dutch, and Butter. A climbing variety of the well-known Canadian Wonder is obtainable locally, and should be worthy of trial.

At this season it will be necessary to watch growing crops of vegetables for the ravages of aphides, and to deal with any attacks promptly by spraying with tobacco and soap wash. Curled and stunted leaves are the usual indications of the presence of these pests. They are mostly found on the lower sides of the leaves, and as the tobacco kills by contact only the spray must be directed upwards from beneath.

The surface of the beds should be stirred and kept loose now; otherwise evaporation is great, and the physical condition of the surface injured.

In the open dry plains country the saving of seeds will come up for consideration now, and all choice plants reserved for this purpose should be covered during the blooming period so as to exclude insects which might bring pollen from inferior kinds growing in the neighborhood. Fine muslin gauze acts well, and should be retained till the seeds are gathered to protect them from sparrows, goldfinches, and other small birds, which are exceedingly partial to most garden seeds.

Salad plants, such as cresses, radish, lettuce, &c., should be sown now in shaded spots only upon the plains; otherwise they are likely to run to seed very rapidly. Egg fruits and capsicums will be sown and planted, receiving treatment similar to that recommended for tomatoes.

POULTRY NOTES.

BY D. F. LAURIE.

The recent show held by the Royal Agricultural and Horticultural Society has been of much interest to poultry breeders generally. I will give an account of some of the principal classes, but not specifying more than a few of the principal birds. The show was about the best we have had in this colony. Of course in some classes we have had better quality on former occasion, but on the whole all classes were well represented by good birds, with occasional specimens of high merit. A great many people are particularly interested in the fancy or show points of the different breeds, which is a good thing. There are certain standard points to be found in the best specimens, and it is evident that if birds of certain type, markings, and other characteristics have proved themselves to be eminently fitted for certain purposes, we are doing right in perpetuating the type, and in doing our best to retain the other

characteristics, as long as we do not subordinate the utility points. Poultry-breeding is now looked upon by the more thoughtful and intelligent portion of the community as an industry full of easily-realised possibilities, and in consequence writers generally are giving considerable prominence to the utility points. Among Australian writers I believe I was one of, if not the first, to bring the utility points into prominence in connection with pure breeds of high quality; and years before there were any exports of eggs or poultry to England from any colony I wrote on the subject and its probable successful issue.

In their desire to be in the front ranks in pointing out the utility points of various breeds, some writers are apt to overdo the thing. It is all very well to tell an experienced breeder that, as long as he has and breeds birds of a certain type, and infuses fresh blood at frequent intervals, there is no need to pay attention to markings and other so-called fancy points. When, however, such advice is given to breeders generally, whether experienced or otherwise, there is grave danger of opening the way to the production of mongrels. If all poultry breeders were competent and scrupulously honest, there would be no need of caution; but, as this is not the case unfortunately, we have to be on guard, and divergences from type and marking are often our only outward evidence of foreign blood. It is of course nonsense to give an undergrown Wyandotte, poor in type, the prize simply for good color and marking; at the same time every big fowl, somewhat like a Wyandotte, is not a good specimen, nor necessarily worthy of a prize.

The geese again attracted much attention by their excellence; never before have better specimens faced the Adelaide public. Not only are Mr. Caterer's prize Toulouse geese excellent as regards type and marking, but they are also most symmetrical.

Plate I. shows the gander; contrast this with an ordinary farm yard gander and it will be seen that, apart from the fact that this bird bulks three or four times as much, he is more compact and has

nothing like the length of leg. Long legs may be all right in waders or emus, but are quite out of place in birds bred for table purposes.

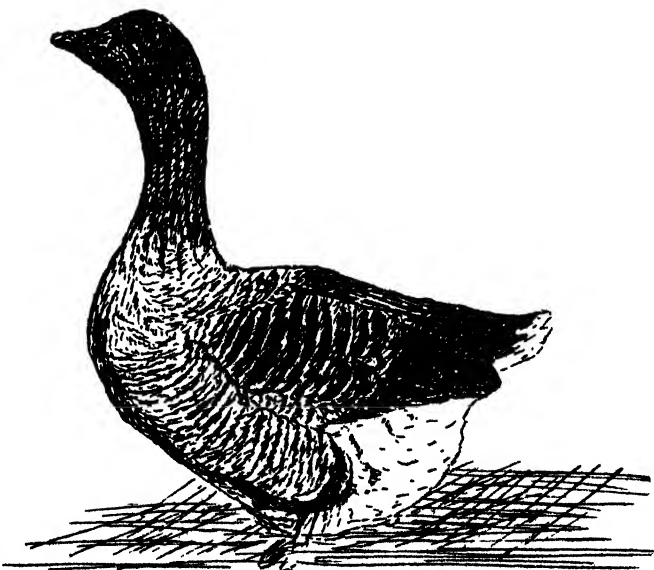


PLATE I.

Plate II. shows the goose; she is the same one which won the special at the Crystal Palace Show, Sydenham, London, in 1895, and afterwards was purchased and imported by Mr. E. T. Sichlau, of Geelong, one of our principal breeders in Australia of Toulouse geese and American Bronze turkeys. This

goose is perhaps the best in type, &c., that has appeared in the show pen at an Australian show. She won at the recent Dog and Poultry Show in July. I recognised her immediately I saw her. The gander is also a good bird, but the judge at that Show must have been thinking of something else when he gave the first prize to an inferior bird. It was gratifying to see these good birds, as I had only recently written concerning the breed and its value. I was eager to show breeders what actual geese—which, doubtless, anyone can inspect by arrangement—are like, and

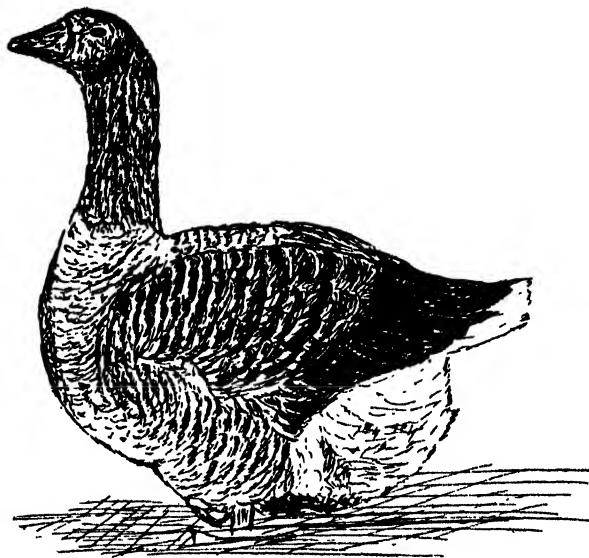


PLATE II.

Mr. Caterer courteously supplied me with photographs, by Spink & Co., of Adelaide, which I copied for reproduction. I find that some people are under the misapprehension that illustrations are always typical, and not counterfeit presentments of actual birds. It is to be hoped that this class of bird will be spread throughout the colony, and that fresh birds will from time to time be imported to provide fresh blood.

Mr. Caterer also showed a grand pair of American Bronze turkeys; the cock was nineteen months old and scaled just on 38lbs., which is a satisfactory weight. From stock such as this there should be plenty of gobblers weighing about 30lbs. at two years old, which is heavy enough for breeding from. In addition there should be a good percentage of mammoths for show and table purposes. I remember an amusing incident in Melbourne some few years ago. A well-known turkey breeder had a good flock of prime, young American Bronze turkeys to sell; he hails from "Caledonia, stern and wild." Another well-known fancier of the Hebrew religion desired to purchase a prime specimen for his Christmas dinner, or some such equally festive occasion. The price asked was one pound (£1). Our Hebrew friend demurred, but after argument cheerfully agreed to pay the sum of one shilling (1s) per pound live weight for a prime young specimen. He made his choice of a medium-sized bird, and joined heartily in the laugh against him when he found his bird weighed 27½lbs., and had been offered him for a pound. It is just as easy to breed such turkeys as the miserable undergrown specimens we generally see. New blood is badly wanted on our farms; it will give constitution, and consequently the progeny will grow more rapidly, and put on more flesh.

The Dorkings are not up to the standard of former days. Silver Greys have fallen off both in size and markings. A few years ago several hens which were exhibited were especially good in type, size, and color. Some really first-class male birds were also to be seen; those at the recent shows were not a patch on them. In the colored section the same remarks apply. I was instrumental in assisting the State Children's Department to obtain the parents of the birds shown by the Boys' Reformatory, and I hope my oft-expressed advice will be taken, which is that a further supply of colored Dorkings of the best quality be sent for. I know that good specimens are not procurable in the colonies, for several of the principal breeders in the adjoining colonies have written to me on the subject.

Indian Games are holding their own; but it is quite evident that better cockerels are being bred than pullets. Our breeders have yet to understand that such is the case, and that type is of first importance. The leggy Indian Game has practically disappeared, I am glad to say, and there is no hope of success under a competent judge. Although this is the wrong season to view table birds at their prime, still those exhibited must have been a revelation to those who saw the proper type for the first time. This was especially the case with the compact, but small-looking Indian Game-Dorkings. How deceptive these symmetrical birds are in appearance. The recorded weights surprised many. It is of prime importance that, in addition to quality, a table bird should be compact and shapely in appearance.

The Langshan classes were not up to former displays. There were a few good birds, but, as many of our experienced breeders are not exhibiting or have gone out of the breed, we find those who do exhibit are favoring a wrong type altogether. If this class of bird is to be the Langshan of the future, I shall lose no opportunity of warning the public against purchasing such stock. I am glad to say all writers are with me on this point.

Orpingtons are improving, and so far the chief exhibitors are aware of the importance of short legs and good bodies; that they are not quite sure of the correct type was evident from some remarks I overheard concerning Mr. J. H. Hobbs' birds. Doubtless these comments were inspired by jealousy, but they are equally misleading.

Plate III. shows Mr. Hobbs' recently imported cock, a single-combed black, of exceptional quality and correct type. As is natural, this bird moulted soon after his arrival from England, a few months ago, and was not at his best at the Dog and Poultry Show; at the Royal, however, he won first prize. He is a massive bird, broad prominent chest, long keel, short legs, fine bone, grand head and eye, typical short broad back, and is good in color. I have reproduced Plate III. from a photo. by Spink, which, however, was not as distinct as desirable. Later on,

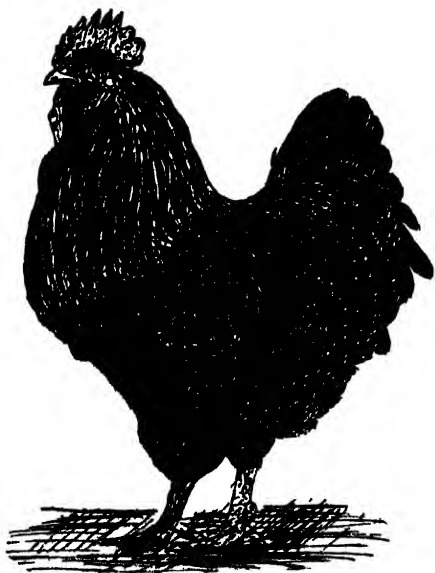


PLATE III.

when the sickle feathers and hackles have grown, this bird will be a grand specimen, and one that any breeder might be proud of. The Orpingtons have fine white flesh, and bone of fine quality; they are large, and mature quickly, and, as the flesh is abundant in the most desired positions and of superior quality, it is evident that the breed is of the highest value. Either pure or crossed with Indian Game, we obtain a chicken, a great flesh carrier, quick to mature, and suitable in every way for the home or export market.

The Wyandotte is another breed steadily gaining public attention, and rightly so. For many years a prime favorite in America, it has of late gained rapidly in England and the colonies. Like the Orpington it is an all-round fowl, a farmer's fowl, a good layer; the pullets generally lay before five months old, plenty of eggs in winter; the chicks grow rapidly, and are ready for table at an early date. Either pure or crossed (with Dorking, Houdan, or Indian Game cocks) we find another first-class table bird for all purposes. The flesh and skin are cream-colored, and the legs bright yellow, but in cross-breeds the legs are generally very pale. There is a craze for lacing, and I honestly believe judges are afraid to strike out for type and size, as they did with the Indian Game. It is all nonsense to say that good lacing and ground color, as well as size and correct type, cannot be combined in one specimen. While not losing sight of lacing and color, type and size are the salient features. Without some safeguard, mongrels may creep in. I have seen cross-breeds between an Indian Game and a silver-laced Wyandotte that far excelled those exhibited as golds at the recent shows as regards lacing and color. I have had several inquiries about head points, which are not altogether fancy points, as the head of a fowl is often an index of character.

Plate IV. shows a typical head, a gold-laced Wyandotte cock being selected; the type, comb, etc., apply to all colors.

Malays made a big show, and although they are not such economical birds to keep, or for use as table bird producers as Indian Game, still they have numerous supporters, and very excellent table fowls result from the cross between the Malay and hens of the Dorking, Langshan, Wyandotte, Orpington, Houdan, or Minorca (big bodied) breeds. The long leg, characteristic of the Malay, militates against its chances for first-class table chicken breeding.

The Houdans were poor. There is little in such specimens to warrant people purchasing them for breeding. Many years ago Messrs. Jolliffe, Hayman, and the writer used to exhibit cocks weighing 10lbs. and 11lbs., and hens 7½lbs. and 8lbs., in good condition only, not fat. They were then grand layers, and something to look at also.

It must have been gratifying for the exhibitors of the numerous splendid ducks to hear the complimentary remarks passed by visitors from the country. The Pekins took the fancy of many, and those who admire them can breed just as fine specimens if they procure good stock and feed the progeny well, and do not neglect change of blood. I heard the remark that they were as big as geese. Had some been weighed and compared with the weights of common geese the result would have been startling. A few years ago I bought an ordinary gosling, warranted young. When cleaned and head and feet off it weighed 5½lbs. I had a Pekin-Aylesbury duckling under nine weeks old weighing 5½lbs. in the same condition. Common goslings and



PLATE IV.

ducklings are not worth purchasing; they are not even worth the bother of preparing for cooking.

I heard more satisfactory accounts of the Indian Runner duck. I take a keen interest in the breed. Eighteen months before Mr. W. B. Rounsevell imported the first quartette to Australia I had written about the breed and illustrated them. Later on my friend Mr. Cadell, of New South Wales, imported, some of which he afterwards sold to Mr. G. H. Dean, of Kensington. Mr. S. Pitman has taken up the breed in earnest, and has several strains, including a recent addition. From time to time he has furnished me with carefully-compiled statistics showing the actual results from some of these wonderful layers. Nine ducks laid 1,891 eggs the first year ending May. They were hatched on November 16, 1897. From May, 1899, to May, 1900, they laid 1,709 eggs. The total for the two years is 3,600 eggs, or an average per duck of 400; that is 210 per duck the first season and 190 per duck the second. This is a record which runs the best laying hens very close. I was not altogether satisfied with the general appearance of some specimens I have seen. Even in England there is a difficulty in obtaining pure specimens of the proper type. The Indian Runner stands semi-erect, they are slender bodied, and with a long, slender neck, with a general sharp alert look. Their gait is a run, no sign of waddle, which shows foreign blood. Ducks marked like Indian Runners which stand horizontally and waddle are only crossbreds, and are of little value for improving the average laying of other breeds of ducks. Breeders are earnestly desired to keep the correct type well in view, or the breed will suffer. I was also pleased to see that the dark-green heads in drakes are not so prominent as usual. Mr. Digby, England's duck king, carried everything before him with fawn-colored heads (drakes). There was much disputing this when I first objected some year or so ago: apart from my own knowledge I am supported by Messrs. Digby and J. Maude; the latter purchased Mr. Digby's winning pair, which were intended for me, but Mr. Digby begged them back again from Mr. Maude. There was a nice drake at the show, quite passed over by the judges; he looked a typical Indian Runner all over. Plate V. will show head and neck of a fairly typical Runner drake.

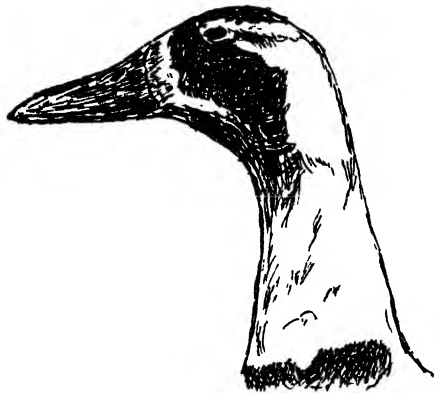


PLATE V.

A few Guinea fowls were on view. When will people understand that there is plenty of money in Guinea fowls? They are excellent in flavor and carry a lot of meat; the flesh is game. They lay well, are hardy, cost next to nothing to feed, fatten easily, and sell at good prices. On an ordinary farm hundreds could be reared yearly at a nominal cost: they do no harm in orchards; on the contrary, they do much good. This closes the list of the table poultry classes. The so-called Muscovy duck never appeal to me; they are hideous beyond description, and unless eaten young the flesh is coarse; half brother to the cormorant.

The laying breeds were well represented by Minorcas, Leghorns, Andalusians, and Hamburgs. I hardly know where to class those very commonplace-looking birds, the Scotch Grey. As layers they are only medium, and also as table birds.

Minorcas have made great strides of late years; they are a very old breed. Some judges are hovering about the breed, and we hear of gamey type, whip tails, and long legs—points utterly foreign to the breed. There were some fair specimens on view, but there were many bad points discernible.

The Leghorns were indifferent as a whole. The white cocks were squirrel tailed, which is a serious blemish. The hens, both white and brown, showed lack of size, and the latter were nothing to boast of in color. We want some really good blood from England. I saw some grand birds in Sydney.

Andalusians were of good quality, but the breed is out of favor, and yet the hens are good layers of fine eggs.

Hamburgs are too small. I had some good gold and silver spangles years ago, much larger than what are now bred, and they laid everlastingly, and fine eggs. Mr. Maude had some splendid black Hamburgs some years ago, fine size, but none came this way. They are splendid layers. There was one big hen in the show, but she was a Minorca-Hamburg cross. The type was too evident. I have been a regular attendant at shows, and have never before witnessed such a general display of interest on the part of visitors to the Royal show as on this occasion. This shows that our producers are alive to the value of the poultry industry. It is to be hoped that those who attended will induce those who did not to pay more attention to breeding a better class of, and more profitable, poultry.

From various sources I hear that the season so far has been fairly good for hatching. In numerous cases there have been failures, due either to ignorance of certain rules, or, on the other hand, to useless experiments. All young poultry should be well fed and cared for, as any neglect while the birds are young will be in evidence later on.

Keep all drinking water shaded from the sun; it should be renewed daily at least, and must be sweet and clean.

Provide fresh green food daily for all birds which have not access to a grass run.

Do not run ducks, fowls, geese, and turkeys together; they thrive better if separate.

Allow no accumulations of droppings or filth of any sort, as such will cause disease.

It will soon be time to preserve eggs for use at a time of scarcity. There are numerous methods, many of which have been described from time to time. Infertile eggs are best for the purpose.

Do not waste the poultry manure; it is a splendid fertiliser, but must be applied with judgment.

Do not overcrowd your stock; if you do the young birds will not grow and thrive. Keep a watchful eye on each bird; at the slightest sign of ill health examine it carefully. Give crushed bones to young stock; it supplies material for the frame and muscles.

Do not waste poultry food; soft food, if left to become sour, will scour the birds, and loss may occur.

Dropsy.—A reader of the *Journal* writes for advice on a case of what is evidently dropsy of the comb of a Minorca hen. Dropsy of the wattles is not unusual, and I have seen several hens slightly affected in the comb, even at shows. At first the comb is pale; then, as it swells, it becomes of a bluish or deep purple color owing to the pressure exercised by the fluid within and the plethoric state—an anæmic condition. Such a condition may arise from blows or bruises, or may result from plethora, which causes the effusion. This effusion of the surplus blood into the comb or wattles is similar to the relief afforded to human beings from a bleeding at the nose.

Poverty of blood is due to lack of necessary constituents in the food; a want

of iron is especially indicated. Sulphate of iron (green copperas) should be placed in the drinking water. Dissolve 2ozs. in a pint of boiling water, in an earthenware vessel. When cool and settled, add a tablespoonful of the solution to each quart of drinking water. The well-known Douglas mixture is made by pouring a gallon of boiling water on a pound of copperas, and as it cools stirring in a fluid ounce of sulphuric acid. When cool add a tablespoonful to each quart of drinking water. Do not use a metal receptacle for the drinking water.

When a case of dropsy occurs, the wattle or comb should be opened at its most dependent part with a lance, or even a large darning needle. The blade of a pocket-knife, if quite clean and sterilised by dipping in boiling water, will do. After thoroughly evacuating the contents syringe out with a weak solution of perchloride of iron, which will coagulate the blood and stop bleeding.

Where green food is scarce the use of Epsom salts is beneficial. A little may be added to the drinking water twice a week, or a packet may be dissolved with sufficient warm water to mix soft food for a dozen adult fowls.

No time should be lost in hatching out birds intended for breeding from. The earlier such are hatched the better, so as to be well matured by next season. The heavy breeds should be at least twelve months old before being bred from. The laying breeds may be bred from as soon as matured, which should be about nine months of age.

Do not breed from turkeys or geese under two seasons old. Their progeny would be small and lack vitality. It is better to breed and rear a score of fine healthy young birds than a hundred indifferent ones.

To make poultry pay as it should each bird must serve a definite purpose. Do not attempt to keep too many breeds; even experienced breeders cannot do full justice to more than two or three. Stick to, say, two; and, for whatever purpose they are kept, see that they are brought to the highest point of perfection. Those who breed for show should remember that there is more honor attached to breeding a winner than winning a prize with a bird bred by someone else. Perfection as layers or for table are the points to be aimed at by the utility breeder.

WINE AND CELLAR NOTES.

BY ARTHUR J. PERKINS, GOVERNMENT VITICULTURIST.

Of late years *sweet acid* wines have become somewhat uncommon in our cellars. Without wishing to absolutely condemn the use of the type of *coolers* so largely adopted by our principal winemakers, I am, nevertheless, of the opinion that they are not mainly responsible for this great improvement in our wines. As working towards this result there have been two other factors of equal, if not greater, importance, that are often forgotten. It cannot be denied that ever since these coolers have come into general use we have been favored with exceptionally fine vintage weather. Whether with the inevitable return at future vintages of serious barometric disturbances and days of extreme heat, they will still continue to apparently keep in check the mannitic ferment is, as yet, largely a matter of conjecture. From experiments conducted during the past vintage, experiments that I propose continuing during the coming season, I am inclined to doubt that a very small quantity of water circulating through pipes on the surface of large vat of must will be capable of removing sufficiently rapidly the enormous surplus of heat generated during a tumultuous fermentation. Take, for instance, a by no means extreme case of a 2,000gall. vat rising in twelve hours from 80° F. to 100° F. Placing conditions in their most favorable

light, it would take, during those twelve hours, at least 2,000galls. of water at 60° F. to maintain the temperature stationary. How would our stocks of water hold out did unfavorable conditions prevail for weeks in succession in cellars of large dimensions? And further, anybody who has by means of a long stem thermometer taken the temperature of the submerged cap, when top and bottom were apparently cool, will know that no reliance can be placed on mere surface readings.

Favorable weather and coolers are not, however, the only factors that have served to render sweet acid wines rare of late. A few years back we worked on musts, the density of which was far greater than those from which our late wines have been made. The rational practice of earlier vintages has largely become a matter of general practice, and to it we owe much of the *soundness* of our more recent wines. The over-ripe must, besides being unduly rich in sugar and taxing the energies of the yeast to the utmost, is deficient in natural acids, forming a medium, given suitable high temperature, well suited to the development of the mannitic ferment. The must of low density contains less sugar, and, in spite of high temperature, the yeast will be able, in most cases, to completely decompose it; and further, it is rich in natural acids that oppose the free growth of the mannitic germ. In this connection a recent note by Mr. P. Carles, on "Mannitic Wines," to the Paris Academy of Sciences, presents some interest.

He took some more or less diseased grapes, crushed them, and after carefully neutralising the juice with potassium carbonate, distributed it in six flasks of equal dimensions. To each flask he subsequently added quantities of tartaric acid indicated in the table below. All the flasks were subsequently placed in an incubator, the temperature of which was maintained throughout at 100° F. to 102° F. In five days fermentation was completed and the flasks were allowed to cool. A few weeks later an analysis was made, the results of which are given in the following table:—

Numbers of flasks	1	2	3	4	5	6
Grams of tartaric acid added to litre of must	2	4	6	8	10	12
Acidity of must in H_2SO_4	1.3	2.6	3.91	5.2	6.5	7.8
Percentage of alcohol	7.9	7.8	7.9	8.25	8.5	8.4
Dry residue	28	26.5	24.5	19	18.25	19.5
Sugar	1.66	1.61	1.58	Traces	Traces	.9
Cream of tartar.	1.5	1.9	2.1	2	2.15	3.05
Total acidity in H_2SO_4	3.25	4.41	4.19	4.11	3.1	3.57
Volatile acidity in H_2SO_4	2.5	3.27	2.54	1.95	.9	1
Color	Broken	Very broken	Little broken	Fine	Fine	Fine
Mannite (approximate)	10	8.5	6	.5	Nil	Nil

Dr. Carles's conclusions are given textually in literal translation:—

"This tables shows that when fermentation takes place in an over-heated medium, i.e., from 100° F. to 102° F.

1. "There is, as at normal temperature, the promotion of a quantity of mannite that increases according as the acidity of the must is less than 10 grams expressed in tartaric acid.

2. "That with this quantity (10 grams) and above there is no further formation of mannite, but an increase in the alcoholic strength.

3. "That the total acidity of the wine is lower according as the initial acidity of the must approached 10 grams in tartaric acid; and this proves that the addition of tartaric acid to musts does result in tart wines.

4. "That the volatile acidity of the wine rises proportionately with the amount of mannite produced.

5. "That an undue proportion of volatile acidity is injurious to the flavor, the keeping qualities, and the color of the wine.

6. "That the presence of mannite withdraws a wine from the normal ratio of *alcohol dry residue* and *alcohol acid*, and therefore renders possible fraudulent fortifying."

7. "That the tartaric acid added may be found in the *marc*, cream of tartar, or lees, whence it may be extracted, and its sale as cream of tartar made to compensate partly the cost of the purchase of tartaric acid."

In brief, his advice is to add tartaric acid to musts deficient in natural acids, with a view of preventively hindering the development of the mannitic ferment should conditions prove unfavorable to natural fermentation. And this advice we might well take to heart.

∴

∴

∴

It seemed to me to be of some interest to follow out the influence of external temperature in wines, and, in consequence, I have had them recorded since May last in the College cellars. For winter months results are as follows:—

Month	TOP CELLAR		BOTTOM CELLAR.	
	Average Air Temperature.	Average Wine Temperature.	Average Air Temperature.	Average Wine Temperature.
	F.	F.	F.	F.
May	54.4	56.8	59	59.4
June	50.1	52.5	55	55.7
July.....	47.6	47.7	52.8	51.1
August	49.8	50.7	53	53.1

It will be seen that during the winter months at all events the temperature of the wine follows fairly closely that of the air, remaining on the whole slightly above it.

THE VINEYARD.

SEASONABLE NOTES.

BY ARTHUR J PERKINS, GOVERNMENT VITICULTURIST.

The rainfall in September, though far from heavy, was, following on our somewhat abnormal August experiences, sufficiently important to hinder tillage operations for several consecutive days. The prospects of the season, so far as good healthy growth is concerned, continue good, and those who have planted new areas should have a satisfactory *take*.

∴

∴

∴

During the coming month vinegrowers must be on the look out for spring frosts; it is, however, extremely unlikely that the future should have in store for us anything similar to last October's visitation. Every vinegrower having at heart the well-being of his plants should possess himself of a minimum thermometer. This thermometer should be exposed every evening to the action of nocturnal radiation, and withdrawn every morning before the sun's rays should have acquired sufficient power to expand the mercury beyond the limits of the

stem. This thermometer should not be placed on the ground, but at about the height of the base of the shoots, i.e., about 18in. to 24in. above the soil. I intimated last year in these notes that on several occasions whilst an exposed minimum thermometer placed on the ground in the college vineyard descended below freezing point, the vines showed no signs of apparent injury. During the past month I have had two exposed thermometers placed, one (A) in the ground and the other (B) at about 18in. above the ground. The results are recorded below.

		Thermometer B.			Thermometer A.
		46 F.			44.5
September	8.....	46	September	19.....	48
"	9.....	37	"	20.....	47
"	10.....	36	"	21.....	49
"	11.....	—	"	22.....	47
"	12.....	47	"	23.....	46
"	13.....	36.5	"	24.....	50
"	14.....	35	"	25.....	43
"	15.....	33.5	"	26.....	42
"	16.....	39	"	27.....	32
"	17.....	50	"	28.....	43
"	18.....	51			42

This makes an average of 41.8° F. for the thermometer placed in the ground, against an average of 42.9° F. for the thermometer 18in. above the ground. The difference between the readings of the two thermometers is most marked on bright cloudless nights, when radiation is intense and frosts likely; on cloudy nights the difference tends to disappear.

As soon as on the exposed thermometer the mercury approaches freezing point, fires should be started, with a view of covering the whole vineyard with a dense smoke. In this connection there are two points to be noted. First that the smoke must be started before the plants are completely frozen, and second that, unless clouds supervene, it must be maintained for some time after sunrise. In a large vineyard the whole area is not equally liable to frost; a careful grower will know the spots more generally affected, and will watch them with jealous solicitude.

..

..

..

The budding of the vines was abnormally late during this season at Roseworthy, and presumably in other districts as well. This must be attributed to the low temperature prevailing during the month of August and beginning of September. I have determined to keep a record in future years of the various vegetative periods of typical varieties; it will enable us to solve questions of great interest to growers. The following dates for the present season have been collected for me in the college vineyard by Mr. J. S. Malpas:—

Varieties	Date of Budding.	Varieties.	Date of Budding.
Pride of Australia	August 20	Malbec (on sandhill)	September 12
Gondis	" 25	Zante Currants	" 12
Verdal	" 25	Caignan	" 17
Doradillo	" 25	Grenache	" 17
Cape Currants	" 25	Cabernet-Sauvignon	" 18
Muscatel	" 29	Mataro	" 19
Albilio	September 12	Malbec (on heavy flat)	" 19
Shiraz	" 12		

Unfortunately, I have kept no previous records; but, roughly speaking, of late years all varieties had completed their budding by the first week in September. It will be interesting to note to what extent this late budding will affect the flowering, and subsequently the ripening of the fruit. Last year certain varieties were in blossom before the night of the frost, i.e., the 26th of October. This is not likely to be the case this season.

September proved a mild cool month at Roseworthy; the average meteorological data recorded up to the 28th being as follows:—

	Mean for Month.	Highest Reading.	Lowest Reading.
	°	°	°
Maximum solar radiation	126·6	144	100
Exposed minimum on soil	41·8	50	30
Exposed minimum 18in. from ground	42·9	51	32
Maximum air temperature	57·7	80·5	57·6
Minimum air temperature	40·9	55·5	33

If, in order to get at the amount of heat stimulating the plants to growth and vegetation, we divide by 2 the sum of the mean maximum solar radiation and the mean minimum air temperature, we get a low amount of effective heat corresponding to 83·7° F.

I have this year repeated experiments with solutions of concentrated fertilising substances applied through the sections and scars formed during the pruning season. The solutions were applied somewhat later than last year, and did not result in so early a budding. Whereas in 1899, to their subsequent discomfiture, vines similarly treated budded early in June; this year the buds only burst on the 14th of August, fully a month, however, ahead of untreated vines of the same varieties. If the frost spares them I shall probably be able to report on the results of the treatment on the fruit crop.

The second ploughing should have been completed during the past month; it is possible that many growers may have been in the same position as ourselves at Roseworthy, and that, in consequence of wet weather, will not complete this operation until the beginning of this month. Scarifying should begin in October; harrowing is generally unnecessary; the scarifiers will level the soil, and reduce it to a fine tilth, quite sufficiently, besides destroying the weeds far more effectively. Vineyards should be clean now, for be it remembered that a clean vineyard is far less likely to be frostbitten than a vineyard overgrown with weeds.

If the spring continues moist our old friend oidium, whom during these years of drought we have almost forgotten, may put in an unwelcome presence. At the first signs of disease the vines should be sulphured vigorously. It might be advisable in any case to sulphur as soon as the flower buds begin to burst, particularly in moist districts. The disease can readily be checked in its early stages, but is more difficult to cope with later on.

ALLFRED CURE FOR MANGE.—It is said that mange on dogs, horses, and other animals can be readily cured by means of lime-water. Stir a quart of quick lime into a gallon of water. Let it stand until it settles. The clear water should be drawn off without sediment—be kept two days—then sponge the parts affected. Take great care that the lime-water does not get into the eyes of the animal. The cure may be effected by one application, or two or more may be needed.

INDIARUBBER AND GUTTAPERCHA.

The secretary of the United States Department of Agriculture in his annual report for 1899 alludes to the importance of the indiarubber and guttapercha trade and its increasing volume. During the fiscal year ended June 30, 1890, the imports of crude indiarubber amounted to 33,842,374lbs., valued at £3,094,690; and of manufactured rubber was valued at £76,365, or a total importation valued at £3,171,325. During the fiscal year 1898 the imports of crude rubber and guttapercha amounted to 46,055,497lbs., valued at £5,288,752; and of manufactured articles and scrap rubber was 9,488,327lbs., valued at £1,976,734, or a total of £7,265,486 for the year. The imports into England in 1898 were 44,858,240lbs., valued at £7,466,340. The value of rubber at New York was 3s. per pound in 1893, and 3s. 6d. per pound in 1898. About three-fifths of the rubber comes from Brazil.

In view of the great value of the trade in indiarubber and guttapercha, there has been much talk about the necessity for the cultivation of rubber-producing plants in South Australia; but, although there are many plants which produce rubber, there are none at present known which will produce it in commercial quantities anywhere outside the tropics. At the same time it should not be forgotten that substitutes for rubber have recently been discovered in certain treatments of maize, and there are strong probabilities that, in the near future, our chemical laboratories may find something that will serve nearly every purpose to which rubber is applied, just as celluloid, &c., is used where ivory and bone were at one time necessary.

Whilst the demand for rubber and guttapercha has increased enormously since the advent of rubber tires and the extension of telegraphs, the supplies from all sources have decreased through the wasteful methods of collection by the natives of the tropical countries where only the plants producing it grow naturally. So far the only successful experiments at cultivating rubber plants have been undertaken by the English Government in Ceylon and some other tropical countries, where it is possible that this may become a very profitable investment. The greater part of the Brazilian rubber is produced by the Para rubber tree (*Hevea Brasiliensis*, synonym *Siphonia elastica*), which is said to thrive under cultivation in our Northern Territory. It is found growing naturally in the deep shade of the swampy forests of the Amazon, where the air is fever laden and the land is unsuitable for human habitation. Experiments have been made with this tree in various parts of the East Indies, but without any marked success, because the tree attains its full development only in the shade of the dense tropical tablelands, and not in the solid plantations. The Central American rubber tree (*Castilleja elastica*) grows only in the dense tropical forests from Southern Mexico to Northern America on rich well-drained bottom lands along the rivers. The Ceara rubber tree (*Manihot glaziovii*) is a native of the driest portions of Southern Brazil, where the mean temperature ranges from 77° to 86° F., and would probably do well in the Northern Territory of South Australia. There are several plantations of this in India and Ceylon.

There are more than fifty species of trees, vines, and shrubs which produce rubber and guttapercha, but the chief sources of rubber are as mentioned above, and of gutta nearly the whole supply comes from *Isonandra gutta*, a native of the Malayan Archipelago.

There is a good deal more of probability of success in growing camphor profitably in South Australia than of producing rubber or guttapercha. We have just the proper conditions in our hilly country and the South and South-

East for the growth of camphor trees ; but we are fortunate in the absence of a humid, sultry, torrid, fever-laden atmosphere, which seems to be essential to the well-being of all known plants producing elastic gums.

A system has recently been adopted of extracting rubber from the "chaffed" bark and wood of rubber-bearing plants by aid of chemicals, whereby a much larger quantity can be procured without absolutely destroying the plants, as has been the case in the past.

WEATHER AND CROP REPORTS.

ALBERT.—The crops are looking well, and are expected to return good yields. Splendid rains have fallen lately.

ARTHURTON.—Feed is plentiful and stock in good condition. Good rains have fallen, and dams are nearly full. Crops are growing rapidly. A light thunderstorm passed over on 18th.

BALAKLAVA.—Weather is still all that can be desired. Crops and feed are looking well. Some wheat is in ear, and hay-making will soon be general. Fallowing is finished, and bright warm weather is desired to enable the rubbish on fallow to be destroyed. Stock in tip-top condition, and feed abundant. Fruit crops promise heavy returns.

BRINKWORTH.—The weather is all that can be desired. Wheat is looking well. Broadcast without manure is not good. Stock doing well, as feed is abundant. Rainfall for year to date 11.58in.

CARRINGTON.—Wheat crops are very promising, and if favored with a good rain, which is now badly wanted, a very fair crop will be gathered. Stock are looking well. North of Carrington shearing has commenced, and the clip is satisfactory.

CRYSTAL BROOK.—The weather has been perfect for farmers, and the crops have made wonderful growth. Feed is abundant, and stock are fat. Hay-making has commenced, and will soon be general, but owing to the heavy crop the price will not be high.

DAWSON.—Several showers of rain have fallen this month, recording about 1.10in., but for several days dry winds have been experienced. Owing to want of moisture in the subsoil the crops are again suffering, and it is certain that the returns will be but little unless very favorable weather comes soon. Feed is very scarce, and grasshoppers are becoming abundant, and are causing great alarm.

GAWLER RIVER.—The weather continues very favorable, and the crops are maturing well. Feed is at its best ; stock in good condition. Fruit trees are blooming well.

JOHNSBURG.—Wheat is coming on fairly, but a good soaking rain is wanted to secure a fair crop. The crops along the hills are more forward owing to the sheltered locality, and frequently showers fall there which do not touch the plains. Feed is fairly plentiful, and stock look well. A large area is under fallow, and quite equal to previous seasons. Cows are milking well, but the weeds are giving the butter a most unpleasant taste. There are plenty of young grasshoppers about, and are causing great anxiety.

KAPUNDA.—Crops look healthy, and are growing rapidly. There is every appearance of a good hay crop and abundance of feed.

LIPSON.—The weather continues very favorable. September opened with good rains. Stock of all kinds are fattening. The lambing was good, and there is every prospect of a good clip. Rabbits are becoming more numerous and are doing a lot of damage.

LUCINDALE.—Good seasonable weather. The crops and grass are coming on very rapidly. Stock are doing well with the exception of a few complaints of sickness amongst lambs and hoggets, due probably to worms. Fruit buds have set very well, and a good crop should result.

MALLALA.—The weather has been most favorable for the crops, and the prospects of the season on the whole are good. The wheat has a good color and is strong and healthy. There is an abundance of feed and horses are in good working condition.

MOUNT BRYAN EAST.—Good general rains have fallen and the crops look well. A good harvest expected. Feed is plentiful and stock in good condition. Locusts are swarming in from the North. Only a small area has been put under fallow.

MOUNT REMARKABLE.—Splendid weather and good rains. In general the crops promise good returns. Feed is plentiful. A few frosts have affected many gardens on the plains. The young trees which suffered from drought for the past few years are now expected to push out again.

MUNDOORA.—Good rains have fallen. Crops look well and feed is plentiful. Early wheats are in head. Hay-making in self-sown crops has started in many places.

NANTAWARRA.—Stock in good condition and feed abundant. Rainfall for year to date 12.08in. Light rains have fallen right through the month, and cereal crops are looking well, and some of the early kinds are coming into head.

PENOLA.—Fine weather with nice and well-scattered rains. Crops looking well. Stock in good condition. Setting of stone fruits very good, and promise good crops. Vines coming away nicely, and with absence of frosts will make good growth. Farmers are preparing for frosts; carting straw and other rubbish to make smudges.

PORT ELLIOT.—Weather still most favorable, and all crops look healthy and vigorous.

PORT PRIZE.—Splendid weather. Although a few frosts are recorded, cereal crops have made good progress. No reports of disease in wheat have yet been received. All grasses are in seed, and plenty of feed is assured for the summer. The wool clip is light, but of good quality. Shearing is general. The flocks are much smaller than of previous years owing to past droughts. Rainfall for year 13·33in.

PYAF.—The weather has been most favorable. Thunderstorms were experienced on the 18th and 19th. These were followed by showers of large hailstorms, which did considerable damage to the blooms on fruit trees. Feed is plentiful, and stock doing well.

REDHILL.—Splendid soaking rains, 4·50in. recorded since last report. Slight thunderstorms. Crops are growing very fast, especially those drilled and manured. Feed is plentiful. Fallowing is about finished, and owing to the wet weather it is difficult to kill rubbish growing on the early fallow. Some wheat is coming out in ear.

RICHMAN'S CREEK.—A good area has been turned over for fallow, being rather more than usual. Hay is being cut in a few places, but hay-making will not be general for another week or two. The crops are fair, especially on fallow near the hills. The rains have been light of late, and a good fall is needed to counteract the effects of the dry weather and frosts, the latter being rather severe of late.

RIVERTON.—Have had occasional showers with fine warm days during latter part of month. Thunderstorms, accompanied by fairly heavy rains, were experienced. Crops continue to progress. It is feared that red rust will set in, owing to too much rain having fallen for this district. Orchards and vineyards look well. Stock in good condition. Rainfall for year to date, 18·91in.

SADDLEWORTH.—Rainfall during August, 5·11in.—a record, being twice the average for past twenty-nine years. Subsoil is soaked, and heavy hay and wheat crops are anticipated. Effect of manuring is evident in the healthy dark-green color of the wheat plant. Feed will soon be abundant. Fallowing well forward, though delayed by frequent showery weather, which has prevented the working of the fallow. Rainfall this year to date, 18·18in.

SCALES BAY.—The weather has been very changeable and uncertain; boisterous winds, followed by good rains, prevailed. Wheat and grass have made rapid growth. The present prospects are in favor of an early and good harvest. Shearing is now general. The clip appears to be about the usual average.

WILMINGTON.—Everything is looking very promising. During August and the early part of this month frosts were very heavy and did some little harm; but owing to the late rains the ill effects have been counteracted. An excellent harvest will be reaped. Some of the crops on the Willochra and around Pinda are in a very forward condition, as also near Hammond. In the hundred of Gregory there are some excellent crops. Grasshoppers appear as though they will be very troublesome again, as myriads of small ones are moving about.

WILSON.—The weather since June has been very disappointing. The frosts and drying winds have had a disastrous effect on the wheat crop. The rains have been very scanty, and locusts are swarming in myriads.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report.—

October 1, 1900.

Another favorable month's weather is encouraging farmers to hope that at last they are about to experience a good season, and if prospects are but fairly realised our wheat yield should be a record one. Still, however, we must keep in view the many risks that have to be taken before reaping time, but as in another month wheat harvesting will have commenced in the earlier districts it will then be easier to forecast. Feed is abundant in most parts, and the outlook generally favorable for agriculturists and pastoralists.

The favorable outlook for country pursuits causes business to rule fairly active. The maintenance in the value of metals in the world's market encourages extended search for minerals, especially copper, in this country, whilst experts continue to report satisfactory developments of the new goldfield at Tarcoola, where investors are showing their faith in the mines by forwarding machinery to the fields, so that in a few months, at any rate, bulk tests should demonstrate the value of the finds.

The breadstuffs market is almost entirely controlled by freights at present, every upward movement in European values being either the result of, or at once inducing, an advance in rates of freight, so that the improved London quotations do not benefit the Australian wheat-grower. For South African loading our Melbourne friends have had to pay up to 4½s. freight,

being a further advance of 5s., whilst for charter to United Kingdom for coming crop 35s. to 36s. 3d. is being fixed. London offers 32s. 3d. for Australian wheat, present loadings, and has evidently some faith in the future, as this figure is higher than obtainable for cargoes afloat close to destination. Reports of the American yield are very contradictory, and when definite information becomes available there will probably be more speculative spirit displayed. Locally, values are hardly as firm as when last quoted. Farmers, as usual during the Adelaide Show week, came to town somewhat inclined to sell wheat, so that during the week it is reckoned 100,000 bags passed into millers' hands, who are, therefore, not now so ready buyers, while shippers have to decline offers owing to the extreme difficulty of obtaining freight. Millers' offer has had good demand during the month at stationary values. Owing to the abundance of growing feed the market for forage has been lifeless.

Trade in potatoes and onions has not been altogether satisfactory. Some dealers and holders in both lines attempted to bolster up prices at above a natural level, but had to give way under the pressure of intercolonial markets. Local stocks, however, are about exhausted.

In dairy produce steadily increasing supplies are reaching market, and week by week heavier shipments of butter to Europe are being made. The delayed advent of the warmer weather is, however, retarding that improvement in quality which usually becomes manifest when feed ripens as we approach summer conditions. The favorable weather during spring time is likely to extend the season, so that prospects of output likely to be available for export have improved. For the first time during recent years the local supply of eggs in West Australia has seriously interfered with the export trade in this line from our colony, a glut having occurred, but demand is again overtaking supplies, so that we may soon expect a revival, and the future of this trade appears cheering to producers. Heavy orders from Sydney kept us clear whilst our western neighbors were off buying. Increased quantities of cheese being marketed, and, in spite of the extreme newness of most samples, prices have improved. Ripe sorts are practically unobtainable. Bacon and hams have been plentiful, and curers continue to grumble at the high rates they have to pay for the live material. Honey has been rather quiet; almonds and beeswax brisk.

In carcass pork and veal fair prices have obtained, although heavy catalogues have been submitted at the auction sales. Poultry has also shown increase, but keen bidding has resulted in even further improvement in price, turkeys especially ruling higher.

MARKET QUOTATIONS OF THE DAY.

Wheat.—New, at Port Adelaide, 2s. 10d. per bushel of 60lbs.

Flour.—City brands, £6 7s. 6d. to £6 12s. 6d.; country, £6 to £6 5s. per ton of 2,000lbs.

Bran.—9d.; pollard, 10½d. per bushel of 20lbs.

Oats.—Local Algerian, 2s. 3d. to 2s. 6d.; ordinary stout feeding, 2s. 7d. to 2s. 11d. per bushel of 40lbs.

Barley. Malting, 3s. 3d. to 3s. 9d.; Cape, 2s. per bushel of 50lbs.

Chaff.—£3 per ton of 2,240lbs., dumped, f.o.b. Port Adelaide.

Potatoes.—Gambiers, £3 to £3 15s.; Tasmanian, prime redskins, £4 10s. to £4 15s. per 2,240lbs.

Onions.—Gambier, £7 10s. to £9 per 2,240lbs.

Butter.—Creamery and factory prints, 8½d. to 9½d.; bulk, 9½d. to 9¾d.; dairy and collectors', 6½d. to 8d. per pound.

Cheese.—S.A. factory, choice, 8d. to 9d. for matured; good new, 7d. to 8d. per pound.

Bacon.—Factory-cured sides, to 6½d.; nice farm lots, 5d. to 5½d. per pound.

Hams.—S.A. factory, 7d. to 8d. per pound.

Eggs.—Loose, 5½d.; in casks, f.o.b., 6½d. per dozen.

Lard.—In bladders, 5d.; tins, 4½d. per pound.

Honey.—2½d. for best extracted, in 60lb. tins; beeswax, 1s. 2d. per pound.

Almonds.—Soft shells, 5d. to 6d.; kernels, 1s. per pound.

Gum.—Best clear wattle, 2d. per pound.

Carcass Meat.—Fair to prime shop porkers, 3½d. to 4½d.; ordinary sorts, 3d. to 3½d.; choppers, 2½d. to 3d.; vealers, 1½d. for medium to 2½d. for good.

Live Poultry.—Nice table roosters, 1s. 9d. to 2s. 4d.; medium cockerels and fair hens, 1s. 3d. to 1s. 7d.; ducks, 1s. 5d. for small up to 2s. for good quality; geese, from 2s. 6d. to 3s. 6d.; pigeons, 7½d.; turkeys, 4d. to 4½d. for fattening sorts; prime table birds, 6d. to 7d. pound, live weight.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, SEPTEMBER 24, 1900.

Present—Messrs. F. E. H. W. Krichauff (Chairman), W. C. Grasby, M. Holtze, H. Kelly, T. B. Robson, Hon. A. W. Sandford, M.L.C., and Secretary (A. Molineux).

Winter Irrigation.

Mr. HARDY reported that, under the superintendence of Mr. Quinn and himself, the two blocks at Marion had received 4in. of water, and he was confident that, notwithstanding the favorable weather conditions of the winter, the beneficial effect of the application of additional moisture during the cool weather would be marked.

Congress.

The SECRETARY reported that this year's Congress was much better attended than any previous one. Eighty-nine Branches were represented by 217 delegates, as compared with 193 delegates from ninety Branches last year. Of sixteen members of the Central Bureau only six attended the Congress. A considerable number of members of Branches omitted to give their names to the Assistant Secretary, although it was specially asked that all members present should do so.

Members commented on the absence of the majority of the Central Bureau members, and it was resolved—"That we regret so few members of the Central Bureau could make it convenient to attend the Congress meetings." It was decided that the various resolutions passed at Congress be forwarded to the Hon. Minister for attention.

Seeds for Experiment.

The SECRETARY reported receipt through the Agent-General of parcel of seeds of the much-praised tan plant, Quebracho (*Aspidosperma quebracho*). He much doubted its suitability for South Australian conditions, as it came from a tropical country. It was decided to ask the Conservator of Forests and Mr. Holtze to sow the seeds.

The CHAIRMAN tabled small packet of seed of *Agriophyllum gobicum*, a plant allied to the saltbushes, and growing in very dry cold country in Siberia. It was decided to send seeds to a few localities for trial. Mr. Kelly thought if our stockowners would only devote some of their time and labor to the cultivation of our indigenous saltbushes they would get much better results than from imported plants. While we were neglecting our suitable native bushes altogether, growers in South Africa and California were taking them up on a large scale with gratifying success.

Smyrna and Capri Figs.

On the motion of Mr. Robson it was decided to obtain cuttings of all the different varieties of Smyrna and Capri figs. Messrs. Holtze, Grasby, Robson, and the Secretary were appointed a sub-committee to attend to the matter.

New Branches.

Applications for Branches at Wokurna and Nildottie could not be approved owing to proximity to already established Branches.

Frosts Affecting Wheat Plants.

Mr. KELLY said last year, after the very cold weather of October 25 and 26, 1899, he had noticed several wheat crops near Angaston and Kapunda badly affected by the night frosts, more especially the beardless varieties. The

beards only of the other sorts were bleached, but the grain filled well. A farmer had since written him that he had King's Solid Straw and Californian Purple in flower during heavy frost, and the beards were whitened, but there was next to no injury to the grain. A patch of King's in a hollow had no grain, but all around was good wheat. Steinwedel was most seriously injured by the frost. Mr. Farrar, of Lambrigg Farm, New South Wales, found the farmers did not agree very well as to the causes leading to damage done by frost; but his own opinion was that the very favorable forcing weather preceding the cold wave following was the main cause of the injury; had the precedent weather been less favorable to strong growth the injury from cold would have been much less. Most probably cold winds had much to do with the damage. He thought the earliness of the bearded wheats mentioned may have had something to do with their immunity; but, nevertheless, the early wheats—Steinwedel especially—suffered the most. Certain varieties undoubtedly possess a frost-resisting character. Mr. D. McAlpine, Govt. Veg. Path., Victoria, relates that late spring frosts damaged the wheat crops in 1899, and Steinlee suffered most. In the Angaston and Kapunda districts, and in the North, King's Early was less affected than any others by frost. Professor Lowrie wrote Professor McAlpine that he thought it one of the best to grow on mallee lands. Bearded wheats are not more difficult to strip than beardless, but the body of the machine fills so quickly that time is lost in going so often to the floors; but the extra yield on mallee lands more than compensates for that disadvantage. He thought farmers should take a note should any frosts occur of the varieties that were least affected, their stage of growth, soil conditions, &c.

Sir Charles Todd, K.C.M.G., furnishes the following report on the weather conditions of October 24-27, 1899:—

The weather over the colony was very cold at this time. A disturbance worked up from the Southern Ocean towards the west coast of Tasmania on the morning of the 23rd, and being of considerable energy, and the following "high" being of large extent. We had strong keen southerly (S.W. to S.E.) winds between the 24th and 26th. I think this keen wind had a very withering effect on the wheat plant.

Snow fell at Blumberg, Uraidla, and Mount Torrens on the 25th, and at Bridgewater, Lobethal, Norton's Summit, and Mount Lofty (heavy) on the 26th.

Hail was reported at the following places:—

October 24.

Anama
Corny Point
Frances
Harrogate

October 25.

Amyton E., Adelaide
Anama, Booyoolie
Blumberg, Bangor
Cleve, Corny Point
Cooke's Plains, Eudunda
Fountain F.R., Glencoe
Green Patch (Port Lincoln)
Holder V.S., Kapinka
Morambro, Mount Torrens
Morphett Vale, Noarlunga
Port Wakefield, Petersburg
Finniss, Smith's Bay
Terowie E., Uraidla
Willunga, Williamstown
Warakilla

October 26.

Bull's Creek
Bridgewater
Frances
Glencoe
Hindmarsh Valley
Lobethal
Langhorne's Bridge
Mount Lofty
Norton's Summit
Walleroo
Woodside
Warakilla

The frost at Riverton on 25th is called a black frost, and S.M. reports that "it was very severe on vineyards and fruit trees, and some wheat crops."

Williamstown on 25th says "frost cut all vines, potatoes, and tender plants."

Auburn, 26th, says "destroyed vineyards."

Koonowla, 26th, says "very severe, 26° F., did much damage."

Woodvale, Yankalilla, 26th, says "sharp frosts, damaging potatoes."

Mount Torrens reports heavy damage by snow and hail on the 26th.

28/9/1900.

C. Todd.

TEMPERATURE TABLE

Highest and Lowest Readings each day, October 24-29, 1889.

October 24.		October 25.		October 26.		October 27.		
Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
69.2	50.6	66.6	45.9	68.0	45.6	73.4	45.4	Farina
64.9	49.0	62.2	46.2	64.1	40.5	72.0	51.0	Port Augusta
58.5	39.6	55.3	32.3	58.3	35.1	62.8	38.8	Yongala
56.0	43.7	52.4	31.4	57.0	33.9	63.0	40.9	Clare
58.9	42.5	56.4	35.0	60.4	35.0	66.4	41.2	Kapunda
52.3	33.0	49.8	31.5	53.3	34.0	58.3	39.0	Mount Barker
56.9	43.3	56.8	36.7	59.9	36.4	65.2	42.4	Strathalbyn
62.0	45.6	59.0	41.8	64.2	37.1	69.1	47.1	Adelaide
46.9	35.0	53.2	31.6	56.4	38.4	63.4	38.9	Stirling West
63.2	52.0	63.1	50.0	65.7	46.5	75.2	50.0	Eucla
60.2	45.0	59.2	42.0	68.2	39.0	72.2	39.2	Streaky Bay
58.3	45.3	57.7	40.7	63.1	41.3	63.1	50.6	Port Lincoln
56.2	42.3	54.8	40.1	59.0	40.5	63.2	44.7	Cape Borda
61.9	55.1	57.1	44.6	54.1	41.2	55.9	39.1	Robe
54.8	43.6	54.2	33.3	56.3	38.0	56.9	47.3	Mount Gambier
54.1	45.2	53.9	43.6	54.6	42.4	54.5	49.3	Cape Northumberland
At Adelaide 58.0 as the max. reading on the 25th is one of the coldest days ever experienced in October.								
—	38.0	—	33.5	—	31.5	—	37.0	Grass { Readings at Adelaide
—	34.1	—	30.2	—	26.4	—	33.8	Wool {

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Carrieton, Mr. J. W. Cogan; Booleroo Centre, Messrs. F. McMartin, W. Clack, and J. Michael; Burra, Mr. Arch. McDonald; Tatiara, Mr. Thos. Motem; Narridy, Messrs. H. McGar, F. Easter, and A. Hiskey; Forest Range, Mr. C. Norton; Angaston, Mr. Jas. Heggie; Lyndoch, Messrs. Paul Zimmermann and B. Ren; Forster, Mr. C. Payne; Riverton, Messrs. A. J. Davis, A. T. Paschke, and F. H. Mitton; Mylor, Messrs. J. Roebuck and C. Nielson; Port Elliot, Mr. H. Welch.

Reports of Meetings.

The SECRETARY reported receipt since previous meeting of 101 reports of Branch meetings.

CHEAP PAINT.—Mix 1 gall. of curds or sour milk to $\frac{1}{2}$ gall. of quicklime in powder. stir in half a pint of boiled linseed oil; allow the mixture to stand twenty-four hours, then stir well and apply with a brush, as with other paint. Coloring pigments, such as ochre or lamp black or Venetian red, &c., may be added. Sulphate of iron will cause a brown color in it.

TO MEASURE RICKS.—Oblong and Square Ricks: Mean length in feet multiplied by mean breadth in feet multiplied by mean height in feet from bottom to one-third of the way up the roof, and divide by any number between 250 and 350 (according to density of rick) = number of tons. Round Ricks: The square of the mean diameter multiplied by .7854 = area multiplied by height to eaves = cubical contents of lower part. To find diameter divide the circumference by 3.14159.

REPORTS BY BRANCHES.

Swan Reach, September 1.

Present—Messrs. J. L. Baker (chair), J. Harris, L. Fidge, W. White, D. Rowe, P. F. Beck, W. Hecker, F. F. Fisher, and O. Halliger (Hon. Sec.).

RAINFALL.—For August, 1'67in.

GRUBS.—The large grubs seem to have disappeared. [If they were “grubs” they have changed into beetles of some sort; if caterpillars, they changed into moths or butterflies. Did any member try to find out what they produced—beetles or moths?—GEN. SEC.]

WHEAT.—Mr. Baker had forty acres self-sown wheat last year. He fenced off ten acres and kept it for crop. This was dirty with grass and geranium, but gave a poorer return than he received from the thirty acres which had been grazed down by stock. He wants to know the reason. [By grazing, the weeds were destroyed for a time, the roots of the wheat plants gained strength, the plants tillered and produced more heads. The enclosed crop was encumbered with weeds, grew up thin and spindled, did not stool well, and therefore produced fewer heads and less grain.—GEN. SEC.]

Tatiara, September 1.

Present—Messrs. T. Stanton (chair), R. Scown, F. Smith, T. Hall, H. Killmier, D. Makin, and W. E. Fisher (Hon. Sec.).

BULL.—Resolved to purchase a purebred Shorthorn bull, of a dairy type, for improvement of the dairy herds of the district. If arrangements can be made a Jersey bull will also be secured.

Gladstone, September 1.

Present—Messrs. W. A. Wornum (chair), J. Rundle, J. Shephard, J. Sargent, J. Milne, G. M. Growden, and C. Goode (Hon. Sec.).

CARE OF MACHINERY.—Mr. J. Milne read a paper on this subject. Machinery should be thoroughly overhauled before being put away for future use, and all wooden parts should have a timely coat of paint. Two members testified to the beneficial effects of boiled linseed oil upon the rims of wheels.

EXHIBIT.—The Chairman tabled excellent Rokewood and Dunn's Seedling apples. Mr. J. Rundle showed some fine lettuces. Mr. Growden tabled a fine branch laden with olives.

Murray Bridge, September 5.

Present—Messrs. W. F. Wundersitz (chair), R. Edwards, J. G. Newmann, J. Stacker, H. Schubert, Heinrich Schubert, J. G. Jaensch, W. Lehmann (Hon. Sec.) and three visitors.

BULLS.—A discussion took place on the best way to procure first-class bulls of milking families for improvement of dairy herds, and it was decided to further discuss the question later on.

FIELD TRIAL.—Hon. Secretary reported that a field trial of ploughs took place on his farm on August 29, and was very successful. There were three four-furrow stump-jump ploughs of latest patterns, viz., one of C. H. Smith's, Ardrossan; Mr. Saint's, of Jamestown; and J. & D. Shearer's, of Mannum; one stump-jump plough of the old pattern, made by Mr. A. Schubert, of Murray

Bridge. There were also one two-furrow plough and one three-furrow cock-shut plough, one pair of stump-jump scarifier harrows, and one spring-tooth cultivator. There was a large attendance of persons interested in the work. The work done by the new improved ploughshares was of very good quality in sandy soil, though they refused to enter the harder and sticky soil in a satisfactory manner. The three-furrow plough of the old pattern did equally good work in sandy soil, and entered the harder soil more satisfactorily than the preceding implements, but the new ploughs seem to be lighter in draught.

Kapunda, September 1.

Present—Messrs. G. Teagle (chair), J. J. O'Sullivan, J. H. Pascoe, J. Schultz, Pat. Kerin, Peter Kerin, W. Flavel, T. Scott, E. Weckert, and G. Harris (Hon. Sec.).

MEETING PLACE.—Agreed to accept offer of a meeting room at the School of Mines at a rental of £1 per annum.

OFFICERS—Office-bearers for past year were thanked. Mr. W. Flavel elected Chairman, Mr. J. A. Schultz Vice-chairman, and Mr. G. Harris Hon. Secretary.

Mount Pleasant, September 7.

Present—Messrs. G. Phillis (chair), W. M. Vigar, F. Thomson, W. Lyddon, J. McConnell, J. Maxwell, H. Dragomuller, and Henry A. Giles (Hon. Sec. *pro tem.*).

CROPS.—Mr. J. Maxwell reported that crops on the whole were very fine; but late sown crops were backward, and in places grubs were doing much damage. Mr. Giles said feed was not as good as last month, and live stock not improving.

RAINFALL.—Mr. Vigar reported rainfall for South Rhine, for August, 3.50in.; Mr. Giles, for Mount Pleasant, for August, 6.43in.

Colton, September 1

Present—Messrs. P. P. Kenny (chair), S. W. Kenny, E. Whitehead, A. C. Riggs, W. E. Packer, and R. Hull (Hon. Sec.).

LOSS OF MEMBER.—Letter of condolence to be sent to relatives of the late W. McK. Elder, a member of this Branch.

FERTILISERS.—Members wish to know whether superphosphate and phosphatic manures can be injured by being kilndried or heated until dry, to make them run through the drill. [No; unless the manure contains ammonia.—GEN. SEC.]

Scales Bay, September 1.

Present—Messrs. A. Newbold (chair), R. S. Thomas, Geo. H. Newbold, Chas. Nugent, and D. P. Thomas (Hon. Sec.).

CATERPILLARS.—Caterpillars are doing much harm to cereal crops. They are of green color, $\frac{3}{4}$ in. in length, and hide during the day under the soil. [Try a mixture of 5oz. white arsenic, 8oz. washing soda, and 5lb. sugar in boiling water, until all dissolved, then add enough water to make a stiff paste with 20lbs. bran and 10lbs. pollard. Make pellets of this about the size of a cob nut and drop about in the crop.—GEN. SEC.]

SEEDS.—Mr. Newbold has Jersey tree-kail raised from seed sent by Central Bureau, and considers it especially useful for this district. It makes a good substitute for cabbage in summer and autumn, and is excellent for cattle. He proposes to grow two acres of it next autumn. Salsify also does well, and is an excellent vegetable, growing without watering. Mr. Nugent has grown sugar beets from Central Bureau seed; a bulb two years' old weighed 14lbs. Only a few seeds germinated.

Richman's Creek, September 4.

Present—Messrs. W. Freebairn (chair), E. Roberts, A. Knauerhase, P. J. O'Donoghue, A. Nicholson, J. J. Searle, and J. McColl (Hon. Sec.).

HAYMAKING.—Discussion opened by Mr. O'Donoghue, who said that if hay is to be fed without chaffing, it should be cut just after flowering, and, if cut with the binder he would not have it tied into sheaves but thrown out loose, as it is cleaner and better for feeding than if cut with the ordinary mower. If intended for chaffing, it would be all the better left till some grain is formed, and should be tied into sheaves. The Chairman considered Red Straw wheat as good as any that can be got, and makes good chaff if cut with the binder. Mr. Searle had known hay to be cut when the grain was full, and after being chaffed, the wheat was winnowed out and sold separately. Members said such "hay" is no better than header chaff. Mr. Knauerhase said when the wheat crop is poor or blighted the hay is always sweeter; he would prefer to cut it when there is a little grain in it. The early wheats generally make the best hay. The Hon. Secretary said solid straw wheats make the best chaff, and if they could get these without a beard so much the better, still, for use on the farm he had found no trouble in the bearded varieties.

RAINFALL.—For August—Mr. Freebairn, 1.41in.; Messrs. A. and J. McColl, 1.45in.

Mount Remarkable, September 6.

Present—Messrs. A. Mitchell (chair), W. Lange, C. E. Jorgensen, T. P. Yates, J. B. Murrell, H. Humphries, T. S. Bishop, J. McIntosh, W. Morgan, and T. H. Casley (Hon. Sec.).

BULLS.—Members are of the opinion that a system of subsidising amounts raised by subscription for purchase, by Branches of the Bureau, of pure-bred dairy bulls for improvement of the dairy herds of the various districts will, under proper regulations, prove beneficial. It was decided, however, not to purchase the bull "Laddie Warwick," which has a grand pedigree, because, with a few exceptions, the farmers in the neighborhood have not availed themselves of his services. Mr. Lange has a good Shorthorn bull which he shut up, and sent his best cows to "Laddie Warwick."

HORSE COLLARS.—Mr. Murrell gave some useful hints about horse collars and sore shoulders. A horse should always be in good working order when being measured for a collar. It is a mistake to try and fit a horse when too fat or too poor. For thin-skinned horses he advocated a false collar. A local case has been practically cured with what is known as sweat pads. He did not approve of packing off the hame-hooks, as is generally done, to keep the trace-chains away from the horse, as this materially affects the inside of the collar. The collars must be continually kept clean else the horses will suffer. The hames are generally too long, and that has a good deal to do with spoiling the horse's shoulders. The hames should be made to fit the collar, and not the collar to fit the hames. The pull should be adjusted to the right place; and hames should always have sliding or reversible hooks.

CO-OPERATION.—The Hon. Secretary read a short paper on Co-operation. From the inception of the Agricultural Bureau the subject had been always prominently before the producers with no satisfactory results. [What about the dairy industry, the Farmer's Co operative Union, the Barossa Horticultural Union, the Mylor Branch Co-operation, and others?—GEN. SEC.] Producers were as far apart as ever, and the middleman was enjoying the fun at the producers' expense. He suggested that the Branch and others should dispose of their by-products by co-operation. If it paid storekeepers and dealers to run conveyances to collect butter, eggs, bacon, &c.. it would pay the producers to do the collecting, and dispose of the same for cash, and to buy their own requirements for cash at wholesale prices. Under present conditions the farmer has to "take it out" in goods, and thus the dealer or storekeeper "gets at him" in two ways, viz., buying produce at say 5 per cent. under retail value and paying for it with goods upon which all costs, with profits added, are charged. To establish a co-operation should cost very little, because the products could be collected and sent to the nearest centres of population without storage or rent of any kind, the collection and carriage being the only cost. The problem was to make a start, and he hoped that this would be done in every suitable district. In discussion members agreed with the Hon. Secretary, but nothing was done to ensure a practical outcome from the paper and discussion.

SEEDS.—The great majority of seeds sent up by Central Bureau failed through drought and locusts. Mr. T. P. Yates has a fine crop of what he sowed for Hungarian Brome grass, but it proved to be a hardy kind of lettuce of good quality. He evidently mixed the labels. Bartlett's Crossbred wheat appears to be suitable for this district, but Indian King is too fine in the straw. Other wheats are doing well, viz, Ranjit, Silver King, Majestic, and Marshall's Hybrid.

Wilmington, September 4.

Present—Messrs. J. Hutchens (chair), R. Coles, F. Bauer, A. Maslin, and R. G. S. Payne (Hon. Sec.).

ENSILAGE.—Mr. Hutchens tabled sample of Cape barley 5ft. to 5ft. 6in. high. He was making ensilage of the crop, and only regretted that he had not sown a larger area for this purpose. Sample was much admired, and was considered proof that green fodder for ensilage could be profitably grown in the locality. Question of purchasing pure-bred bull postponed till following meeting.

Quorn, September 5.

Present—Messrs. R. Thompson (chair), J. B. Rowe, C. Patten, H. S. Stacey and A. F. Noll (Hon. Sec.).

SUGGESTIONS FOR IMPROVEMENT OF BRANCH.—Paper read by Mr. Rowe on this subject at previous meeting (see page 143 of *Journal of Agriculture* for September) was well discussed, and generally approved of. The suggestion that a small fine be imposed on members absent without sending written apology did not, however, meet with support. The meetings of the Branch were for mutual advantage and education of all members, and if anyone did not take sufficient interest in their work to attend voluntarily the best plan was to strike his name off the roll to make room for somebody that would attend.

CO-OPERATION.—Members considered much advantage would accrue to farmers if they would unite to purchase certain requirements for cash in large

quantities. This would specially apply to purchase of plough shares, fertilisers, seed wheat, &c., and the principle of co-operation could be extended with advantage to the purchase of pure-bred animals for stud purposes.

SEED EXPERIMENTS.—The Hon. Secretary reports very favorably of Broad-leaf mustard, which is exceedingly prolific, yielding a large amount of green feed for pigs and other stock. The McIvor sugar melon and Japanese climbing cucumber were also very good. Dart's Imperial wheat was decidedly promising, but was all destroyed last year by grasshoppers. Bartlett's Crossbred and Indian King wheat grew well last season, and had been sown again.

Auburn, September 6.

Present—Messrs. G. R. Lambert (chair), J. E. Isaacson, W. F. Keynes, J. R. Klau, O. C. H. Limbert, and Dr. Yeatman (Hon. Sec.).

SEED EXPERIMENTS.—The Chairman reported that Red Kaffir corn had done well with him, but was not equal to *Holcus saccharatus*. The spring frosts to which the Lower North was subject always prevented it from seeding.

WHEATS AND MANURE.—Mr. Klau mentioned that some of his wheat sown under apparently identical conditions with the rest of the paddock had perished in the ground. Mr. Isaacson asked if this portion had been drilled in with manure soon after pickling, and suggested that if wheat were still damp when sown the manure might adhere and prevent healthy germination. Mr. Klau stated that he had had as good results from Thomas phosphate as from mineral super.; he considered neither suitable for limestone soil. [On the contrary, the latter has proved exceedingly satisfactory on limestone soil. — GEN. SEC.] Some experimental strips, left unmanured, showed little difference on the black soil, but the effect of the manure on the red land was very marked. Mr. Isaacson preferred guano to other manures, as it did not force the wheat so much at the start, allowing it to stool out better.

Holder, September 8.

Present—Messrs. F. A. Grant (chair), J. Rowe, J. Green, H. Blizzard, W. Watt, J. Rossiter, J. E. Trimming, E. Jacobske, H. Perry, N. Vaughan, F. G. Rogers, J. J. Odgers (Hon. Sec.), and three visitors.

CROPS.—Mr. Rowe reported that at Waikerie a self-sown crop of wheat was growing alongside of one that had been ploughed in. The latter had started first, but now the self-sown was considerably the higher. Some members thought the light rains prevailing this season were the cause.

Dawson, September 8.

Present—Messrs. R. Renton (chair), P. J. Byrne, S. Chapman, John Collins, C. W. Dowden, A. J. Hooper, C. H. Meyers, O. Muller, J. H. L. Severin, A. H. Warner, and A. F. Dempsey (Hon. Sec.).

BULL.—Resolved to purchase the bull now upon loan to this Branch by the Department of Agriculture upon the conditions proposed by the department.

SEEDS.—The following seeds have been received from Central Bureau by the Hon. Secretary and successfully grown:—Beets—Eclipse, Extra Early, and Blood Red each did well, especially the last. Cabbages—Earliest and Early Vesuvius very good, but not equal to London and Enfield Market. Carrot—Half-long, very good for this district. Radish—Also very successful.

Cucumber—Jersey Pickle, a very heavy cropper, but produced some very bitter fruit. [Owing to check during growth.—GEN. SEC.] Watermelons—Ice Rind and Cuban Queen both of delicious flavor. Tomatoes—Tom Thumb and Mikado, the first a heavy yielder, the other of grand quality. Peas—French Canner and Fortyfold both produced enormous fodder crops, but were very shy bearers. Mustard—Broadleaf has done exceptionally well, and has established itself as an early green crop for stock, as well as for culinary purposes. Turnips—Bloomdale Swede did well, but not as good as White Stone. Camelina sativa (Gold of Pleasure)—A fodder crop, not sufficiently productive in this district, and dispensed with on account of its propensity to shed its seeds. [This plant is very largely cultivated for its seeds, which are used for oil-expression.—GEN. SEC.] Rye—Summer Saxon, a good spring fodder, stools well, and grows a very heavy crop, but does not ripen its seeds well; can be strongly recommended for cultivation in a good district. Oat—Prevost is a splendid variety, yielding a heavy crop of large white grain. Barley—Beardless grew well, produced a heavy crop, but appears to be extra brittle. Wheat—White Mexican, an early and hardy variety, but will not displace old sorts; Dart's Imperial is a good all-round sort, now largely grown, but ripens late; Bartlett's Crossbred and Indian King are now growing for the second season, and gave promise of a fair return last year.

Narridy, September 1.

Present—Messrs. A. McDonald (chair), J. Liddle, D. Creedon, J. Darley, E. Smart, J. Smart, J. Nicholson, and T. Dunsford (Hon. Sec.).

BULLS.—Recommended that this Branch purchase pure-bred dairy bull on subsidy of £1 for each £1 raised by subscription.

CROPS.—Members consider manured and unmanured crops better this season than for many years past. Mr. Darley said early crops should not be sown until May, and then with manure, which would illustrate the special benefits from manure. It would perhaps be found that early-sown crops on well-fallowed land without fertilisers would compare favorably with those sown later with manures. Mr. J. Nicholson said the judicious use of manures with good cultivation must bring beneficial results. Mr. J. Smart could not understand take-all destroying the wheat, whilst oats and weeds grew luxuriantly in the same place. Mr. Creedon said a piece of land that was manured last year with Thomas phosphate produced a poor crop, but this season, without any further manuring, the same land was producing a good crop, which showed that the effects of manure are continuous.

Lucindale, September 8.

Present—Messrs. E. Feuerherdt (chair), A. Carmichael, Geo. Humphries, H. Langberg, J. Riddoch, F. Wall, S. Tavender, L. McInnes, A. Matheson, and E. E. Dutton (Hon. Sec.).

"IMPROVING THE LAND."—Mr. J. Riddoch read a paper on "The District we Live in, and some Suggestions about Improving the Land." The following is the substance:—

As to climate, he thought Lucindale the best situated in all Australia. The North is subject to frequent droughts; and even the Tatiara, only seventy miles distant, has suffered at times from drought. To the eastward the altitude of the Victorian watershed seems to make that part more subject to frost, and even heavy snowfalls at times. About Lucindale there are seldom any of the heavy fogs that are experienced elsewhere, and cyclones and hurricanes are never known. The plains rise step by step gently from the seacoast, with slight hilly ridges running on the west of each flat, almost parallel with the seacoast, in a north

and south direction. The ridges are thickly covered with trees, which break the force of the westerly gales. Occasionally the heat in summer is rather oppressive, but there is then cool shade beneath the trees and plenty of cool water in the springs. There are very few days when outdoor work is interfered with on account of bad weather. But even in this favored spot there are some drawbacks, amongst which are absence of rivers and drains to carry off the surplus water to the sea. A great deal has been done by the State and by private individuals to remedy these defects, and much remains to be done by the State, by local authorities, and by landholders. The principal channels should be constructed at the cost of the public revenues; subsidiary channels by the district councils along the roads; and drains or ditches into these by the owners or occupiers of land. To lead to this a well-surveyed plan and levels must be prepared and a systematic course and united action pursued until the whole area is drained. This great work could not all be carried out at once; but when the survey and plan have been prepared the systematic carrying of it towards completion can be started at once and finished perhaps years later on. The main drains should be national works, like the main roads, but perhaps a light assessment might be necessary; and the cross drains by the councils, with money supplied by the State, but recoverable by a light assessment on properties, according to the benefit derived. The ditches along the roads should be treated as part of the roads and constructed from the revenues of the councils. The work cannot be undertaken all at once, but should be pursued constantly and persistently as means and opportunity afford.

Nantawarra, September 4.

Present—Messrs. J. Nicholls (chair), R. Nicholls, H. J. Spencer, E. J. Pridham, R. Uppill, J. W. Dall, S. Sleep, and T. Dixon (Hon. Sec.).

BRANCH AT MOUNT TEMPLETON.—Central Bureau wrote that a number of residents at Mount Templeton were desirous of forming a Branch, but being too near to Nantawarra the request could not be granted. It was decided to invite three residents from the district in question to join this Branch.

PAPERS READ AT BRANCH MEETINGS.—Mr. Pridham thought the papers should be printed as read and discussed at a future meeting, so that members were afforded an opportunity to study the subject. Mr. Dall thought the papers were often improved by passing through the General Secretary's hands, as they were concise and better conveyed the writers' meaning than as originally written. Mr. Pridham intended to bring the matter forward at next meeting.

OBTAINING SEED FROM TURNIPS.—Members wanted to know best way to treat turnip plants to obtain good seed. Two members were trying the effect of transplanting.

STANDARD SAMPLE OF WHEAT.—Mr. Sleep said there appeared no chance of having an alteration made in regard to this question. It seemed most unfair that if wheat was a little underweight it should be docked in price on account of being of less value than the standard, while, according to the merchants, wheat over the standard was not worth any more than the standard sample. Other members agreed, while some pointed out that farmers received a little more on account of overweight.

Forest Range, September 6.

Present—Messrs. J. Vickers (chair), A. Green, J. G. Rogers, R. Townsend, J. Sharpe, C. Stafford, J. C. Jennings, J. Green, O. Kumnick, J. Rowley, and J. Caldwell (Hon. Sec.).

DRAINAGE.—The Hon. Secretary read a paper to the following effect:—

Few will deny the importance of drainage, especially under the conditions which we have at present, and most will agree with me that it is a question capable of being studied with great advantage to those connected with gardening in the Hills district. There can be no better time than the present to consider the matter, as on all hands we hear complaints from those who cannot get on to their ground on account of wet. On beds which have a good natural outlet, or are properly drained, a few fine days will make the ground fit for working, but there are a great many places which will either have to be left till after the proper planting time, or

else mucked over in their waterlogged condition, when the crop will be anything but satisfactory. The necessity of drainage often comes vividly before us when we have a large bed that we want to crop, and cannot get on the ground with the plough or spade even. Very often it is just one end, or a wet patch in the middle, which will retard the cultivating operations for a fortnight or more, and then the wet patch will not produce the same amount as the other parts. In the first place, what is a drain? A drain is an opening or channel into which the surplus waters on higher levels gravitate and flow off; it will not prevent all the water from soaking through the soil into lower levels, but simply catches the water and carries it to its outlet, except such as soaks into the ground below the bottom of the drain. The amount which soaks from the drain depends on the nature of the soil through which the drain is cut; if it is cut into a good stiff clay there will be very little leakage, but if only a shallow drain, passing through a loose porous soil, anything that lies below the level is bound to keep wet as long as there is water running in the drain. Therefore, to make a drain effective requires that it should either be taken down into the clay, or that none of the other parts of the bed or land should be lower than the surface of the drain. It is mostly the waters that soak down from the hills which keep our flats so wet, so that if this is properly cut off no trouble ought to be experienced. If there is a wet place on the bed it will invariably have the lightest crop on it. The reasons for this are many. In the first place, the ground being full of water prevents the air from having access, and the exclusion must be a disadvantage. The wet soil takes much longer to be affected by the temperature of the sun, for when the soil is wet the heat, which ought to be warming the ground, is expended in evaporating the moisture; acting under the same principle as shown by rolling a wet cloth around a jug of milk in the summer time. Another reason why the crop does not thrive on these places is that when we do get enough of fine weather to dry them, instead of remaining loose, like the well-drained beds would, they bake, causing the ground to open in large cracks, and when this occurs the plants stop growing, or grow very slowly, not only spoiling the look of the bed, but resulting in a loss. Draining can be overdone by having too many deep open drains, as these will allow the sun to have too much access in the summer time, with the result of drying all the moisture from the soil; but I do not think we could make it too dry by underground drains, as I have always found that the soil keeps moist right over the top of the underground drain, thus showing that it is an advantage to have it drained even for summer crops. Where artificial manures are used we do not get the full advantage when the ground is soaked with water, and it should be the rule to always see that the land is properly drained before using manure, otherwise the best results will not be obtained from the manures applied. Our rainfall is not excessively heavy compared with what they get in some parts, but our subsoil is not capable of absorbing all the rain that falls on it at certain times; hence the necessity to provide artificial means of drawing the surplus moisture off in the wet weather. The depth to which the drains should be made cannot be definitely determined, but must be decided by the nature of the ground. As a rule, they are not deep or large enough, so that they either get blocked or do not drain the ground so well as they ought to. There are a great many ways of making underground drains, and each one can best decide what will be best to use; but it will be well to always try to do the work thoroughly, so that it will last for a number of years.

Mr. Vickers had a piece of ground with a good fall and outlet for surplus water, and still it remained too wet, owing probably to the nature of the soil. He believed the only way to deal satisfactorily with this was to break it all back, putting stones at the bottom, making, in a sense, a rubbly subsoil. He had formed drains 2ft. wide by 2ft. 6in. deep, small stones at the bottom and larger flat ones on top, very effective. Mr. Townsend had been to a very considerable expense trying to drain a patch of a very sodden nature, and, although they had improved the ground, it had not been so effective as expected. The water did not seem to find its way readily into the drain, often running parallel to it for some distance. He used 4ft. slabs for sides and top of drains, making them of considerable size, and covering the joints with pieces of paling. Mr. Sharpe had constructed a fairly long drain with two wings, and found the land below the wings all right, but above it was still too wet. He found that drains constructed of 20in. slabs laid crossways as good as almost any made. Mr. J. Green said in putting an underground drain through a very wet piece of ground he cut through a bank of clay, and was now able to work the ground at almost any time. He believed the clay was the cause of the ground holding the water so; he used 4ft. slabs lengthways, and found them very useful. Mr. Kumnick made his drains about 20in. deep, put in 6in. to 8in. of stones, and covered with poles or bushes; he found them very effective, the crops

growing far better close to and even over the drains than further away. Mr. Rowley considered a good deep main drain necessary in order to give the cross drains a good fall. He had drains still doing good service after fifteen or sixteen years; they were constructed by placing large rough stones on the bottom and smaller ones on top, covering all with brush. He believed if the sodden ground referred to was worked deeply in summer time it would allow the water to get into the drains in the winter. Considerable damage by the floods during the past few weeks was reported.

Norton's Summit, September 8.

Present—Messrs. J. Jennings (chair), A. Smith, J. J. Bishop, J. Hank, J. Pellew, H. Horsnell, and W. H. Osborne (Hon. Sec.).

ERROR.—In report of latest meeting it was stated that several varieties had been the result of sowing one packet of seed received from Central Bureau. It should have been "that several differently named packets turned out to be one and the same variety. Especially has this been observed with variously-named packages of lettuce."

Bakara, September 7.

Present—Messrs. R. Barrow (chair), J. Roy, E. Wall, R. Wilson, T. Hermann, A. Hermann, and J. V. Barrow.

FIELD TRIAL OF PLOUGHS.—Arrangements in connection with field trial of ploughs, to be held on October 11, were dealt with. It was resolved that the public judge the implements.

Craddock, September 8.

Present—Messrs. R. Ruddock (chair), J. Paterson, B. Garnet, J. H. Lindo (Hon. Sec.), and three visitors.

FERTILISERS IN DRY DISTRICTS.—Mr. Paterson had inspected some crops at Richman's Creek which had been drilled in with 56lbs. of superphosphate per acre, and was astonished at the wonderful effect of so small a quantity of fertiliser. He estimated that from present appearances the manured crops were worth four times as much as the cost of the manure over the broadcasted crop. He had heard, however, that when the wheat and the super. were drilled in the soil together when dry the germination of the seed was seriously affected. It was in such cases better to put the manure in the ground, and when rain came broadcast the wheat. "Bluebush" land appeared to be benefited by the application of phosphates, as was the "white" or limy soils. Mr. Garnet had advocated the use of the seed drill, and would also like to try the effect of phosphates in these dry districts. One season rain was late in falling, but afterwards fell very regularly, the result being that the crops matured in twelve weeks from germination, and he believed that when other conditions were not favorable to quick growth a dressing of superphosphate would stimulate the plant, which would otherwise remain practically dormant until favorable natural conditions for growth prevailed. The Hon. Secretary had observed the beneficial effect of phosphatic fertilisers on the wheat crops in the Northern Areas, and also that the drilled crops were better than those broadcasted. He believed the mineral fertilisers would be more beneficial in the dry northern districts than what might be called animal or vegetable fertilisers. The Chairman had satisfied himself that the application in this dry district of farmyard manure was absolutely injurious to crops.

Lyrup, September 4.

Present—Messrs. A. Menzies (chair), J. Sykes, T. Nolan, G. A. Bollenhagen, A. Weaver, P. Brown, O. Klemm, A. Pomeroy, W. H. Walling, W. H. Wilson (Hon. Sec.), and one visitor.

LUCERN.—Mr. Klemm tabled plant of lucern 3ft. high and weighing altogether 3lbs. It had not been irrigated at all, but had been sheltered by the weeds growing round it.

GREEN FEED FOR FOWLS.—Mr. Menzies advocated the cultivation of green feed for poultry. The fowls should be confined by means of hurdles, and part of the crop only fed off at a time.

BIRD PESTS.—Starlings and goldfinches were reported to be appearing in considerable numbers, and fears were expressed that they would injure the fruit trees by picking out the buds, as in other parts.

Gumeracha, September 11.

Present—Messrs. D. Hanna (chair), W. Cornish, J. C. Gall, W. Jamieson, W. A. Lee, A. E. Lee, W. V. Bond, J. Monfries, A. Moore, H. J. Kramer, T. W. Martin (Hon. Sec.), and one visitor.

THE CULTIVATION AND HARVESTING OF FIELD PEAS.—Mr. Cornish read a paper on this subject to the following effect:—

To grow field peas alone without any other crop that would benefit by the cultivation of the peas would not pay at present prices unless the crop was very good. I speak from experience, having grown peas on the same farm for forty years with varied results. Some years I have sown from 2bush. to 3bush. to the acre, and reaped about the same as sown; on one occasion I sowed 2½bush. to the acre and reaped 40bush.; on another I sowed thirty-four acres and gathered 1,200bush. Much depends on the weather. Sparrows are often very troublesome, destroying the plant altogether. Hot winds and caterpillars are responsible for much damage, but for all this the pea thrives well in the hills where there are good summer rains. We are more certain to get a crop of wheat after peas than after fallow. Peas are saleable because they can be used for so many things—for feeding poultry, cows, and horses, and are not surpassed for fattening pigs.

Peas may be sown from June 1 till September 1, but July is the best month here. Three bushels of seed and 3cwt. of bone manure to the acre should procure a good crop, especially if sown through a drill. The ground should be well harrowed and rolled, that it may be in good order for the pea rake at harvest time, which should commence when the pea stalk is yellow and soft, so that the peas when raked together may consolidate. No pea-grower should be without a pea rake. If there are no peas in the pods and the straw is short it will not gather them clean. It is the full pod catching and holding in the teeth of the rake that pulls them; the heavier the crop the cleaner the work. It is far superior to the scythe. Three men and one horse with the rake will pull and put together from six to nine acres a day. If peas are not pulled when the straw is soft the straw will curl and not go together, and the wind will get in, shedding the peas and carrying away the straw. Peas pulled with the rake will be loaded on the wagon in less than half the time than if cut with the scythe, and one-third more be put on the wagon each time. The carting and thrashing should be done in cool weather. The thrashing-floor should be 60ft. in diameter, and should be got ready a month before thrashing, so as to harden. A floor 60ft. in diameter will take a full wagon load at once. In thrashing, many people roll them out with a land roller, but they are generally too small and drive the straw up in heaps instead of getting on top. The best way is to make a roller about 9ft. long, 2ft. thick at the small end, and 2ft. 6in. thick at the big end. A splendid roller can be made as follows:—Get two wheels, one small and one large one, knock the boxes out, and fit one wheel on each end of a piece of timber 4ft. x 4ft. x 9ft. long. Fit the wheels on facing each other, cut the spokes off about 9in. from the nave, bolt twelve pieces of hard wood, 4in. x 3in. to the spokes, one end to each wheel, fasten a piece of fencing wire around each end, and, with a frame, you will have a splendid roller.

Mr. Jamieson agreed that peas were invaluable as a fallow crop. Mr. Cornish was too modest to state that he was the introducer of the pea rake into this colony, to the great benefit of the pea-grower. Mr. Moore would scarify the ground in the late summer to destroy weeds before ploughing land for peas.

Brinkworth, September 6.

Present—Messrs. S. Aunger (chair), H. J. Wilke, R. Cooper, A. L. McEwin, H. J. Shepherd, G. Freebairn, W. Wundke, A. W. Morrison, C. Ottens, J. Stott (Hon. Sec.), and several visitors, including ladies.

HOMESTEAD MEETING.—This meeting was held at the residence of Mr. G. Freebairn, members inspecting the stock, implements, and crops on the farm. The crops, all of which had been drilled in, were looking strong and healthy. The plot containing the Majestic wheat received from Central Bureau was inspected; the plant is strong and stooling out well, promising a grand return. Mr. Ottens states his plot of Ranjit wheat from Bureau seed was equally promising. After the meeting members were entertained at tea by Mrs. Freebairn, a goodly number of visitors being present, after which a hearty vote of thanks was accorded to Mr. and Mrs. Freebairn.

FIELD TRIALS.—Mr. McEwin referred to the question of field trials, and deprecated the action of the manufacturers and importers of agricultural implements in declining to take any part in the recent field trial at Bute, and members agreed.

Hartley, September 5.

Present—Messrs. W. Klenke (chair), H. Reimers, J. Jaensch, A. Jaensch, W. Kutzler, A. Thiele, and B. Wundersitz (Hon. Sec.).

SEEDS.—Members report very favorably of Dart's Imperial wheat. Mr. W. Klenke secured 7bush. of seed from 4ozs. in three seasons; Mr. W. Thiele, 10bush. Mr. Klenke also spoke well of Laibach lettuce and Mammoth Long Red mangolds, which stood two years before seeding.

WOOL.—Mr. Thiele said wool should be properly sorted, fine and coarse wool in separate lots. [Branch members would do well to invite Mr. Geo. Jeffrey, wool instructor at School of Mines, to come up and address them upon this subject.—GEN. SEC.]

OXALIS.—This weed is becoming very prevalent in this locality, and members wish to learn how to eradicate it. [The "soursops," or *Oxalis cernua*, is a most difficult plant to exterminate. The only way to do so is to smother it by growing crops which will rapidly cover the ground and keep the light off, or else to cut off every leaf directly it appears.—GEN. SEC.]

Woolundunga, August 15.

Present—Messrs. J. Grunike (chair), J. G. Moseley, H. Aldenhoven, N. J. S. Rogers, T. H. Prosser, J. H. Michael, J. Greig, and N. Rogers (Hon. Sec.).

PIGS AND BACON.—Mr. T. H. Prosser read a paper to the following effect:—

Pig-raising does not mean getting together a lot of pigs of any sort. But any man that intends to make it pay must deal with it on the same lines as cattle or horse raising. He should select the right sorts, and the first point is to get a pig that will grow well and mature early—a pig that is deep and long, for with a long pig you can cut and come again, and you will be able to give him plenty of feed, and he will not get too fat. If you grow a short pig with a round carcass, he will put on too much fat and you have nothing to cut at. The next thing is the color. For some time I have been trying to grow white pigs, but it is rather a difficult task to get good white pigs. For some years all good pigs have been of the black strain. I have been fairly successful in crossing, and this year have had a few very good white pigs to kill. The reason I favor white pigs is they are very much easier to clean, saving time and labor, which means money, and can be got up much nicer for the eye to look at, and they take the smoke better than do black pigs—you can bring up a better gloss on them. In my opinion the pig of the day is the white Yorkshire. Next you need to be careful to have the bulk of young pigs to come in about July, so as to be able to feed them up well while milk is plentiful, have them

well on by the end of January, and then feed them up well in February and March on hard food, to be ready to kill as soon as the cold weather sets in. Great care should be taken to always keep them growing—it will never pay to keep a starved pig. To grow pigs successfully there must be good sties for them. Pigs want plenty of room, so as not to get slushy and dirty. I don't think a netted yard with barb wire can be beaten for them. Pigs ought to be dealt with as outlaws when visiting their neighbors' places. There is plenty of sale in Adelaide for pigs if the farmer has them at the right time of the year. If you send dressed pork to Adelaide it must be properly cleaned. Some of the storekeepers of the North send to Adelaide for factory bacon when just as good an article can be made at their own doors. He knew of one who always gets the local article for his own use, while he buys factory for sale. No pig should be allowed to live over twelve months or get much more than 100lbs. weight. It is a great mistake to kill old pigs and expect to make good bacon; you may sell some at first, but not the second time. The pig must not be made too fat. There is not more than one person in twenty that will eat fat bacon. It should be nice and streaky, and to do this great care must be taken in feeding. From a financial point, it is a very easy matter to feed all the profit away. A pig should always be kept full, and if you have not enough good food for him, put some water with it and fill him up; do not let him be crying all day. There is a great need for systematic feeding, otherwise the balance will be on the wrong side at the end of the year. A man who keeps no cows has little chance of profit from pigs; and he who expects his wife to feed the pigs is below contempt. If water is available for irrigating green fodder it would be an advantage, and it would be a great help if one acre was grown properly netted in, and the pigs could be turned on to it; and this would save a long bill at the mill. With regard to bacon-curing, I have different ways of doing it. Some people say to make rolled bacon it should be pickled first, but that is a mistake, as you cannot then get it so tight together, and another thing it will go mildewed if great care is not taken. I salt and roll my bacon the next morning after killing, and have always had good results.

Elbow Hill, September 4.

Present—Messrs. H. T. Styles (chair), C. G. Ward, J. Harvey, W. M. Beinke, W. Crook, and G. Wheeler (Hon. Sec.).

BULL.—Members are strongly in favor of purchase of pure bred dairy bull for improvement of the dairy herds, by subscription, with a State bonus of £1 for each £1 raised.

ARMY REMOUNTS.—Members wish to know what classes of horses are required for this purpose. [See *Journal of Agriculture* for September, 1900.—GEN. SEC.]

FOREST TREES.—Mr. Wake announced that he had a number of sugargum trees for distribution. He had raised these for members from seed received from Central Bureau.

Hahndorf, September 8.

Present—Messrs. T. H. Sonnemann (chair), C. Jaensch, G. Sandow, T. Grivell, C. Bom, P. Schubert, and D. J. Byard (Hon. Sec.).

EFFICIENCY OF BRANCH.—Mr. J. C. Rundle wrote, offering a number of suggestions for stimulating the interest of members in the work of the Branch. Amongst these was a proposal that a series of outside lectures should be sought. Resolved to adopt these suggestions.

FRUIT-GROWING.—Apricots fail frequently to produce fruit in this locality owing to gumming and occurrence of frost during blossoming. A member sought advice about treatment of woolly aphis (*Schizoneura lanigera*) on apple trees. One member had painted trunks and limbs with a mixture of tar and lime, and another with a strong solution of sulphate of iron, in both cases without injury to the trees, and with good results. [The insects exist continuously upon the roots, and in spring many of them rise to the branches. Sea water will kill a great many upon the roots, and fumigation with hydrocyanic acid gas will destroy all upon the branches for the time. The only

effectual way to cope with the evil is to dig up and burn the affected trees, and plant trees that have been doubly worked upon blight-proof stocks and scions. Northern Spy is the best stock and scion for this purpose.—GEN. SEC.] Mr. Sonnemann said his seedling apples were devoid of flavor, but Mr. Grivell said he had raised a really fine variety. [About one amongst 100 000 seedling apples may prove to be equal to some of the best existing varieties; and even then it may require to be worked on to blight-proof stocks. Better consult Mr. Quinn as to which variety should be grown either for our own market or for export.—GEN. SEC.]

Boothby, September 10.

Present—Messrs. J. T. White (chair), J. A. Foulds, E. Bradley, A. Robb, J. Bell, D. Sims, G. T. Way, R. M. B. White, H. S. Robinson, H. G. Evans, and R. Carn (Hon. Sec.).

AGRICULTURAL POSSIBILITIES.—Mr. Foulds read a paper, in which he said wheat-growing was not strictly farming, but so far it had been the only thing that could be grown with a chance of profit—and even that was not always realised. Could potatoes be grown? For home use, at least, an attempt should be made. They should select a piece of retentive soil in a gully or on the side of a steep hill, and mulch it with some light close material. Commercial fertilisers should be used. [See *Journal of Agriculture* for July, 1900, page 988 for the best application.—GEN. SEC.]

SEEDS.—Members reported on seeds received from Central Bureau:—Japanese cucumber, very good. Mammoth Ironclad watermelon, excellent. Dart's Imperial wheat, the best ever tried in this locality. Early White May onion is excellent. Bush bean is suitable for this district.

CLIMBING CUCUMBER.—Mr. Evans said the best way to grow this is to dig a hole 2ft. square, loosen up the bottom, fill in with alternate layers of loam and fowl manure about 6in. thick, then put in branches for the plant to climb upon.

FRUIT TREES.—Members report that few kinds of fruit trees appear to thrive here.

Golden Grove, September 6.

Present—Messrs. J. R. Smart (chair), A. Harper, H. P. Day, J. Woodhead, W. Montstephen, G. McPharlin, F. Buder, J. Anderson, J. R. Cole (Hon. Sec.), and five visitors.

SEEDS.—Members reported on seeds received from Central Bureau, as follows:—Kentucky Wonder summer bean and Galland's Hybrid wheat, distributed six years ago, are still cultivated here, and are well liked. Sorghum halepense (Aleppo grass, also known as "Phillip's grass" and "Johnson grass") has proved a very good and hardy summer grass, but is a nuisance when grown on land required for tillage.

ANATOMY OF THE HORSE.—M. J. White, M.R.C.V.S., attended, upon invitation, to give an address upon this subject, but refused to address so small an audience.

BEEs.—Mr. Harper stated that, in addition to the resident beekeepers of the district, many of whom have been established for several years, it had become the practice with travelling beekeepers to dump down their extensive apiaries in the district during the period of flowering of the eucalyptus, &c., with the result that the country becomes overstocked, and the strong colonies take to robbing the weaker hives.

MANGOLDS.—In reply to a member, Mr. Harper recommended sugar beets to be sown during September in drills, using up to 20 tons per acre of farm-yard manure. Mr. Coles said the Orange Globe mangold is best for shallow soils, and Mammoth Long Red for deep soils. Sow seeds in a nursery bed during January, and transplant up till September. The objection to transplanting is that they put out such a lot of fibrous roots if not put down straight, or if the soil happens to be hard.

Stansbury, September 1.

Present—Messrs. A. Anderson (chair), C. Faulkner, P. Anderson, J. Henderson, J. Sherriff, H. C. Pitt, J. Antonio, and P. Cornish (Hon. Sec.).

MIXING MANURES.—A member has very fair result from mixing Ohlen-dorff's super. with basic slag. Super. alone has given better results than when mixed with stable manure. [It is never safe to mix these fertilisers more than forty-eight hours before applying, and even then there is always some risk.—GEN. SEC.]

“**SOUTH AUSTRALIAN FODDER BUSHES AND GRASSES.**”—Mr. P. Anderson read a paper dealing with this subject. First he spoke of the spear grasses (*Stipa*), of which there are at least ten species indigenous to the colony. It grows without cultivation, and when rain falls the seed revolves by aid of its long awns and bores into the soil. It is a splendid fodder for all kinds of stock, but is fast disappearing from our agricultural districts. There are, of course, a great number of other valuable indigenous grasses. The Sheaoak (*Casuarina quadrivalvis*) has proved a grand stand-by for stock during seasons of scarcity. It will withstand cutting back, and thus can be dwarfed into a bush, or left to become a fair-sized tree. The Government of India is growing this tree for fuel purposes. The Native Hop (*Dodonaea viscosa*) is a magnificent fodder for cattle and sheep, but sheep will eat it right out of existence unless it is allowed to get a good start. Grasses will grow right up to the stem of this shrub as luxuriantly as elsewhere. It continues in all seasons and weathers to produce young shoots. It should not be allowed to grow too high. The saltbushes grow well here in places with very little rainfall, and all classes of stock thrive on it. These are considerably cultivated now in Cape Colony and in California, where they are greatly valued, especially for cultivation on the alkaline soils. If we had none of these plants growing naturally we would want to import seeds in very large quantities; but, being indigenous, we seem to overlook their great value. He suggested that experiments should be conducted in the cultivation of our indigenous fodder bushes with and without fertilisers.

CAPE OATS.—Mr. P. Cornish tabled some oats grown by himself, and just coming into ear. The plants are very healthy, and over 4ft. high. He had found a difficulty in getting the seed through the drill, so mixed it with super. and sowed it broadcast, and harrowed it in.

Cherry Gardens, September 11.

Present—Messrs. R. Gibbins (chair), T. Jacobs, C. Lewis, J. Lewis, G. Hicks, E. Wright, A. Broadbent, G. Brumby, and C. Ricks (Hon. Sec.).

SEED EXPERIMENTS.—Mr. C. Lewis distributed seed of Chantenay carrot. He received the seed of this variety from Central Bureau two years ago, and it had proved very satisfactory. It was stated that owing to the extremely wet season the main crop of potatoes in this district will be late.

Redhill, September 6.

Present—Messrs. R. Nicholls (chair), A. A. Robertson, S. H. Treloar, A. E. Ladyman, D. Lithgow, H. Darwin, and J. N. Lithgow (Hon. Sec.).

AGRICULTURAL SHOWS.—The Hon. Secretary read a paper to the following effect :—

Agricultural shows are intended to foster and benefit every sort of agronomical industry ; but, as usually conducted, they are not so useful as they should be. Most people are agreed that there are too many shows ; but Prof. Lowrie would limit them to three annually—one in Adelaide, one in the North, and another in the South—but these would not be sufficient, as there would be many who could not afford the travelling expenses, and therefore could never attend a show. Country societies should amalgamate and hold shows in each place alternately ; but this would doubtless be strongly opposed by those societies which have held a premier position for a number of years. If the shows continue to increase as they have done of late it will become necessary for Parliament to check the subsidies granted, as it is a waste of public money to encourage opposition shows. The prizes are so numerous and of such small pecuniary value that they are not much regarded, and a prize exhibit is held in no higher estimation than the general run of entries, because judges say they cannot be expected to judge from an Adelaide point of view, else the whole class would have to be rejected, so they award the prizes to the best, whether worthy or not. At the Adelaide shows there is generally a deficiency in competition of horses and cattle. Surely this is not because the breeds are not in the colony. Many people have an idea that they possess nothing good enough to compete against the breeders who exhibit and carry off the prizes. In cattle they think it is useless to compete, as probably the same animals, being faultless, take the prizes year after year, the judges having no other alternative. Could it be made a rule that an animal taking first prizes consecutively should compete in the champion class for the third year, and if it takes the prize for that class should be debarred from further competition ? There can only be one best, but there may be many worthy. At country shows prizes should never be offered for implements, &c., of no special value in the locality. As to machinery, money prizes are of little value to the exhibitors, as the advertisement afforded by a first prize is sufficient to recoup all expenses ; and even those who take no prizes often make sales. It happens sometimes that a machine or implement which receives no recognition at a show will last longer, do better work on the whole, and cost much less for repairs than the prizetaker, which looked better and did even better work on the show ground. The system of awarding certificates of merit has been adopted by several societies. As a rule, there is always something to be learned at these shows, although to some people they are only the occasion for a picnic. Some of the members did not favor the amalgamation of agricultural societies nearly adjacent and holding shows in each place alternately, nor did they favor the championship idea, but all thought that the number of shows should be decreased and that they should be holden more centrally.

Watervale, September 10.

Present—Messrs. C. A. Sobels (chair), E. W. Castine, J. Thomas, G. Hunter, W. Field, L. Buring, H. Croft, and E. Treloar (Hon. Sec.).

APRICOTS.—Rough weather and heavy rains supposed to be the cause of apricots blossoming scantily this season. Orchards and vineyards cannot be properly worked for the same reason.

Kanmantoo, September 6.

Present—Messrs. J. Downing (chair), W. G. Mills, T. Hawthorne, J. Hair, A. D. Hair, and F. Lehmann (Hon. Sec.).

MERINO SHEEP.—Members consider quality in the Merino ram should be considered before size ; the ewe should be large in frame. The faulty points on either side should be corrected by good points on the other ; but extremes should not be too great. If a sheep has good wool on the belly the other parts would be proportionately good. Mr. Mills said he had aimed some years ago to get large-sized sheep with good quantity of wool, and he had succeeded.

Angaston, September 1.

Present—Messrs. F. Salter (chair), R. Player, J. E. Swann, S. O. Smith, A. Friend, J. Vaughan, F. Thomas, A. Sibley, J. H. Snell, W. Sibley, M. Andrew, P. Radford, and E. S. Matthews (Hon. Sec.).

FARMERS' EXCURSIONS.—Members consider the present railway arrangements with respect to passengers all that is needed by the producers.

PRUNING.—The Hon. Secretary read a paper, of which the following is the substance :—

A good pruner having learnt the "why" and the "wherefore" of pruning does not stop at that, but is ever acquiring knowledge, adapting himself to soil, situation, growth, and surroundings, always keeping in view the principles of the art of pruning. The man to be careful of is the one who "knows all about it," has an opinion of his own, and generally goes out of his way to try and convince you that his method is the only correct one, and everyone else is wrong. There are too many gardening men and boys who assume that they can prune. I well remember the lessons taught myself and brother by the head gardener, Monsieur Gabriel, at the Duke d'Orleans'. We had to follow him through glasshouse after glasshouse, intently watching all his "cuts," he explaining each in its turn; and when at last we were trusted to prune vine or stone fruit we had to give a good reason for all of our "cuts." It is not the learning to prune that takes up the time; it is getting some men to unlearn what they so easily picked up, but are so unwilling to drop. An orchardist may be a practical, capable pruner, managing his vineyard and orchard thoroughly well, but unless his sons have studied his methods, acquired his knowledge, after a careful study of soil, situation, and surroundings, they are but a trifle superior to the man in the street. Some men readily admit their incompetency in shoeing, milking, riding, grafting, and budding, and yet readily assume they can prune. The greatest exponent of pruning, Professor Bailey, tells us that, after a lifelong study of this question, he is still gaining knowledge. In most professions there is a right and a wrong way of doing a thing, but in pruning every man has a way of his own. It is no uncommon thing to see two orchards side by side, soil the same, situation and surroundings similar, yet the pruning quite dissimilar, and each occupier will assure you that his way is superior to that of his neighbor. Pruning matches have done much to clear the way for a uniform system of pruning and will do much more. Visits to gardens will do something, but unfortunately there is so much to disappoint. In some gardens we go to learn, and find we could teach, only you must not tell the occupier so; he is one of the many who have nothing to learn, whereas he has so much to unlearn. Pruning alone cannot be depended on to make a tree fruitful. It is only one of the means to make it bear; other means are, good soil, thorough tillage, proper varieties, spraying for insects and fungi. When the tree is once in a fruitful condition, pruning should be such that the bearing habit will not be upset. Very heavy pruning of the top always tends to make wood, and usually at the expense of fruit; the habit of allowing trees to go unpruned three or four years and then pruning heavily keeps them in a constant state of wood-bearing. Get your orchard into good bearing condition and keep it so by a little careful pruning each year. Pruning is a means of thinning fruit. A peach pruner instinctively thins out, though he may not exactly know why; but he is lessening the struggle for existence and giving the fittest the best chance. Very great good can be done by practical demonstrations conducted by competent pruners in orchards situated centrally in fruit-growing districts. There are two matters which must be observed by all fruitgrowers: quantity must give way to quality, and the life of the tree should be considered; its bearing capabilities should be extended over a number of years, and we should see to it that we do not take the lifelong crop in the space of a few years, as so many are trying to do. What a grand object lesson to some colonists would be the aged espalier pears, so often met with in the garden at home, bearing their loads of fine uniform fruit year after year. I very much fear our orchards are in many cases being sacrificed for our vineyards. This should not be. There is plenty of room for the proper cultivation of both.

Arthurton September 6.

Present—Messrs. W. H. Hawke (chair), C. L. Palm, M. Baldock, J. W. Parker, H. Baldock, T. Baldock, and J. B. Rowe (Hon. Sec.).

VOLUNTEER CROPS.—Upon the question, "Should selfsown crops be allowed to mature and be harvested?" the Chairman said he would prefer to let the stock feed it down before it ripened, because such crops befall the land if cut for hay, as the stock distribute the seed of the weeds in every direction. Most

farmers now follow the routine of one year feeding, one year fallow, and one year cropping. Land here becomes overrun with the poisonous *Pimelia* bush, which gets raked up with the hay when ploughed and sown without previous fallowing, and when the hay is chaffed the poison is injurious to horses and cattle. Fallowing destroys most of the *Pimelia*. Volunteer crops impoverish the land. There has been too much of the bad plan followed here that was at first adopted in the South of taking everything off the land and returning nothing. If farmers wish to reside permanently on their land they must pursue a rational and systematic course. Professor Lowrie tells the farmers that they can expect no more than 4bush. per acre from land that is never manured. It is a mistake to expect two crops from a field that has been manured only once. Raising of young stock removes phosphates from the soil; so does a wheat crop, or any other cereal. Our parents came here with the idea of taking fortunes out of the soil, and returning "home" to Great Britain; but South Australia is our "home," and it is unwise to impoverish the land. Land that has produced a selfsown crop is liable to red rust when we have an early season, with rains, and, if the weather conditions are favorable, it spreads rapidly. Mr. Baldock noticed a great variety of weeds growing in one of his selfsown crops, and did not think such crops are profitable.

Pyap, September 19.

Present—Messrs. J. Harrington (chair), J. Bowes, B. T. H. Cox, W. Axon, E. Robinson, J. Napier, J. F. Bankhead, G. Napier, W. C. Rodgers (Hon. Sec.), and six visitors.

SEED EXPERIMENT.—Produced from Central Bureau seeds. Mr. Cox tabled fine samples of Oxheart and Long Yellow Stump-rooted carrots. These were distributed to members for replanting for seed production. Mr. Cox also presented packets of seeds of Peerless and Cole's Early watermelons, and Short Green prickly cucumber.

POULTRY.—Mr. Robinson was recommended to try a weak solution of carbolic oil as a wash for combs inflamed and turning black. [See "Poultry Notes" in this issue.—GEN. SEC.]

Belair, September 7.

Present—Messrs. O. Nootnagel (chair), H. Halstead, John Halstead, W. J. Bartlett, and Geo. R. Laffer (Hon. Sec.).

HILLS CONFERENCE.—Members promised to attend Conference of Hills Branches at Cherry Gardens on October 4.

SEEDS.—Red Kaffir Corn was reported on very favorably by several members. It required but little attention.

POTATOES.—Mr. John Halstead read the following paper:—

Having had the failures of our potato crops brought under our notice within the last week or two, I thought a few notes on this, one of our most important industries, would be useful. Last year 8,406 acres were planted in this colony, realising a little under 50cwt. to the acre, a very poor return indeed. There is something radically wrong in this low average, and that wrong is principally if not wholly owing to the seed. With more care in the selection of seed the colony ought to produce from the above area fully 60,000 tons, which would be worth £240,000 at the lowest. Of course there would be a large surplus after providing for household uses and seed, then the remainder could be most profitably used for distilling purposes. In France alone fully 18,000 tons are used annually in the manufacture of spirits, &c. The few details I propose giving will relate to growing them profitably and to growing the right sorts. In the first place the soil for potato-growing in our own district, which is an early one, should be of a friable, and all the better if sandy, nature, and on the high rising slopes. If situated so we need not fear the frosts. It is generally on the cold flats where the frosts cut

them down, and in many places where they are subject to it the growers want to grow early potatoes when they can only grow late ones. It is hardly necessary to state anything regarding the preparation of the soil, as we all know that in our climate the deeper it is worked the better the results, especially root crops. You cannot have too good a soil for them; it is useless cropping poor land. Now as regards the kind of seed. This is the most particular part of the whole. If one gets worn-out seed, be the soil ever so good, he cannot bring them round again. For the past five years the seed supplied to early growers has been a complete failure, and the reason of this is we have been planting year after year seed that has not had sufficient change of climate. Growers that have had seed imported from the other colonies have been favored with good returns. Growers should combine and import their seed, or use Mount Gambier sorts. Of course, they must be of a variety to suit the situation. One variety of seed may not suit all growers. The Prolific is a potato we have tried this season for the first time, and, as its name implies, it is a wonderful bearer; but it is not adapted for spring crops, though it does well later on for summer cropping. Until a few years ago there was no better potato grown than the Beauty of Hebron. We have dug 8 tons to the acre of this variety, but now I doubt if you get sufficient return to pay for the manure. The Regent is another good sort, and does better in colder situations than the previous two mentioned. Lastly, there is the Red or Rough Skin. This variety, I believe, is the coming potato; if planted in fairly good soil they will grow almost anywhere. I am glad to see so many new sorts introduced by Mr. Kitchauff have been tried with so great success, because unless the seed is imported and tested in this manner I am afraid the crops of the future will be valueless. Although it will take a few seasons to properly test them, one variety may not suit every district or position of land. As regards manuring, the ground in our district, not being rich in itself, requires heavy manuring every year, although we have grown them with great success by using stable manure one year and chemical manure the year following, using about 15cwt. to the acre of the latter.

Yorketown, September 8.

Present—Messrs. J. Koth (chair), H. Hughes, T. H. Thomas, S. Vanstone, C. Domaschenz, A. Jung, and John Davey (Hon. Sec.).

COMMERCIAL FERTILISERS.—A discussion took place on the values and results of the various commercial fertilisers now being used in the district. [The above report would have been of some value to other Branches and to farmers generally had the Hon. Secretary recorded the opinions and conclusions arrived at. A mere record that certain members met and “discussed” matters is of no value whatever. These remarks apply to the Hon. Secretaries of several of our Branches, and I respectfully request them to make a note that reports must record the gist of what was said and concluded at Branch meetings.—GEN. SEC.]

Lipson, September 8.

Present—Messrs. G. Provis (chair), H. Brougham, Chas. Provis, Caleb Provis, Jas. McCallum, J. Wishart, jun., H. Brown, Jas. Brown, W. F. Darling, Geo. Carr, E. J. Barrand (Hon. Sec.), and five visitors.

CHARCOAL FOR PIGS.—Mr. Caleb Provis advocated feeding charcoal occasionally to pigs, as it had a very beneficial effect. The Chairman asserted that charcoal would cure pigs suffering from phosphorus poisoning.

EXHIBITS.—Mr. Darling tabled large turnips, one of which measured 22in. in circumference and weighed 5lbs. Mr. Caleb Provis showed swede turnips, four of which weighed 9lbs. The Chairman tabled Giant radish, and Mr. Chas. Provis Dwarf Marrowfat peas and oats grown with and without manure. The plants that had received 56lbs. super. per acre were 4ft. 9in. high, while those not manured were only 1ft. 3in. The Hon. Secretary tabled plants of Steinwedel wheat, manured and unmanured.

POTATOES.—Mr. Caleb Provis advised sprinkling wood ashes on cut setts of potatoes before planting.

Robertstown, September 9.

Present—Messrs. W. Westphalen (chair), J. Armstrong, H. Kotz, H. Rohde, H. Farley, W. Farley, W. Mosey, sen., J. E. Milde, T. Hagley, and S. Carter (Hon. Sec.).

LICENSING OF STALLIONS.—Members favored the examination by a qualified veterinary surgeon of all entire horses, and the issue of a certificate as to soundness, the expense of same to be met by a tax on all stallions.

EXHIBIT.—The Hon. Secretary tabled samples of White Milan turnips grown from Bureau seed.

Balaklava, September 8.

Present—Messrs. P. Anderson (chair), C. L. Reuter, W. H. Sires, G. Reid, E. Hains, A. W. Robinson, J. Vivian, W. Smith, and E. M. Sage (Hon. Sec.)

CULTIVATION AND MANURING OF CEREALS.—Mr A. W. Robinson read the following paper:—

The soil may be looked upon as a storehouse for plant food, and it should be the object of every farmer to cultivate his land so as to have as much of these ingredients as possible readily soluble for the young plants at seed time. This can be brought about only by early fallowing and a thorough cultivation of the soil. Many farmers, by their actions, seem to think that now they are using artificial manure there is not so much need for cultivation. They never made a bigger error in their lives. A soil might be ever so rich in plant food and yet yield poor crops—simply through insufficient cultivation the elements have not been rendered available. Then again by manuring we have to bear in mind that it is one or more of these substances—nitrogen, potash, phosphoric acid, and occasionally lime—which may become deficient, and that a deficiency of any one of them cannot be made up by an excess of another.

It will be necessary for me to divide my paper into two headings—Theoretical and Practical, taking the former first. I have already stated that good results cannot be obtained by manuring with insufficient cultivation, neither is it possible to obtain good results continuously with thorough cultivation and no application of manure. Many people will say, "Oh, give us plenty of rain and we will grow anything"; but it is a mistake. By taking Sir J. B. Lawes' of Rothamsted, experiments this can be clearly exemplified. These have been carried on for the last thirty years. Confining the comparison of the average to the last twelve years, the following was the weight in pounds of an average crop —

	Corn.	Straw.	Total.
Wheat grown continuously without manure	730	1,120	1,850
“ “ “ with special manure	2,340	4,928	7,268

The soils here are exactly similar and in the same field—strong land on clay with a substratum of chalk; the management is the same in so far as cultivation is concerned, both crops are kept equally clean and free from weeds, the same seed is used, and they are exposed to the same changes of weather. The only difference is that in the one case nature has for thirty years been unassisted by manure, and in the other the soil receives every year the various kinds of manure which have been found most suitable to the crop. The result of this treatment is a return of three times the weight of corn and four times the weight of straw, for an expenditure of manure which leaves a profit of 100 per cent. on its cost. In both cases the wheat is grown continuously year after year.

Tillage.—Whatever the physical or chemical properties of the soil may be, it will produce but little if not well tilled, and what is true in this respect of the best soils, applies in far stronger terms to the worst. Apart from its immediate end, the provision of a proper seed bed, the objects and effects of tillage may be enumerated thus—1. To stir and loosen the entire soil to a sufficient depth so that the roots of plants may freely extend themselves in search of food. 2. To pulverise the soil and mix thoroughly its constituent parts so as to increase its absorbent and retentive powers, and to effect an equal and economical distribution of manure. 3. To destroy weeds and foreign plants which rob the crop of food and check its growth. By opening the soil and rendering it permeable to air and water the inert material contained in it, both organic and inorganic, are converted into soluble plant food.

Absorbent and Retentive Powers of Soils.—If there were no difference in soils than that of texture, that which contained the greatest amount of finely-divided matter would possess an advantage over the soils with coarser parts. One cause of this superiority consists in the greater absorptive and retentive power, which finely-divided matter possesses, due mainly, in

all probability, to the immensely greater quantity of internal particles in a given bulk or weight of the more finely-divided soil. The ammonia floating in the atmosphere is continuously being washed into soils in solution with rain water. Clay and the organic matter contained in the soils perform the important function of absorption. This property of clay may be one of the circumstances which render clay soils better for wheat than sandy soils. But although clay contains a larger proportion of this absorbed substances than sand or loams, it cannot be doubted that these must receive from rains the same amount of fertilising matter as the clay, only they have less ability for retaining it, or at least for storing it up. The power of soils to absorb and retain moisture is in direct ratio, not only to the quantity of organic matter in the soil, but also to the fineness of its state of sub-division; hence it becomes important in a practical point of view to secure a proper degree of fineness in the particles of a soil if it is to withstand drought.

Amount of Tillage Requisite.—Good husbandry gives to every soil and crop its proper tilth. The stiffest and poorest soils require the greatest amount of tillage. Light sorts, however, are rarely over-cultivated. Much working and pulverising of a naturally light soil will not make it more loose and open, but have the contrary effect, making its natural porosity less and its density greater. It is possible, of course, to have a soil too loose, for it must have a certain consistency to retain moisture and support plants, but too great a looseness is a rare fault and one not without its remedy. By harrowing land while it is still damp and by heavy rolling as it becomes drier the necessary degree of firmness may be obtained. The soil may be frequently too open, but that indicates either a want of sufficient tillage or an injudicious application of it. In dry weather clay soils are brought to the finest tilth with the least labor by harrowing immediately after ploughing or cultivating and accompanying this operation when necessary with the use of the roller.

I think we as farmers ought to pay more attention to harrowing and rolling than we do at present. I have proved them to be wonderful means of retaining moisture and getting an early germination of the weeds. Harrows pulverise the soil to a depth of 2 in. or 3 in., and reduce to fineness the surface clods or lumps that are left after ploughing, and they shake out and separate the weeds that are in the soil and smooth the surface inequalities, by which means the seed is more evenly deposited and is more likely to have a uniform germination. The roller breaks lumps which often contain seeds of some weeds that otherwise would not germinate till after the wheat has been sown, the result being a dirty crop. Secondly, it gives a greater degree of compactness to soil which is too loose, friable, making it firmer. Thirdly, it puts a smooth, level surface on the soil, which presents fewer points of evaporation.

Manuring.—Experience has taught us that our cereal crops find most difficulty in obtaining phosphoric acid from the South Australian soils, and in nearly all cases a dressing of superphosphate alone has given wonderful results.

Application of Manures.—A manure gives the biggest results only when its constituent are brought into contact with the roots of the crop. To obtain this contact to the fullest extent the manure must be thoroughly and evenly distributed. It should be the aim of every farmer, therefore, to have his manure dry and free from lumps, and not console himself by saying that because he has such and such a machine there is no necessity for him to trouble what condition his manure is in. It pays handsomely to sift lumpy manure. No dressing of manure is completely taken up by the crop to which it is applied. Dressings larger than the actual requirements of the crops must, therefore, be employed to obtain a given result. We as farmers have a prejudice in favor of quickly soluble manures because the quickest return of capital invested is obtained. But I think many farmers are making a mistake by making their dressings of manure altogether too light. I know I will meet with a lot of opposition by making this statement, but when we know that a 15bush. crop of wheat removes from the soil about 111bs. of soluble phosphoric acid, what must the loss have been all the years that we have been cropping on our now worn-out lands? And yet we will see farmers to-day applying 30lbs. or 40lbs. of a manure containing thirty-six per cent. of soluble phosphate, and imagine they are bringing their lands back to fertility. These farmers are simply jerking a crop off their land so treated and leaving it very much impoverished. I would, therefore, recommend a dressing of 1cwt. and certainly not less than 100lbs. By this application one would not only obtain good crops, but would also be enriching his land and restoring its fertility, thereby increasing its stock-carrying capacity. One farmer in this neighborhood has told me he has used heavy dressings of manure for twelve or thirteen years. It has paid him handsomely, and if he were to discontinue manuring to-day his land, in his opinion, would produce better crops than when he started applying manures.

In conclusion, I would like to draw attention to the neglect that is exhibited in this and other districts to the care of farmyard manure. There is no other manure that supplies all the ingredients necessary for the plant, and when applied to land it has an everlasting effect on the pasture. When applied to stiff clays it greatly improves its physical texture. Sir John B. Lawes tells us that for every ton of straw consumed on the farm under proper management the farmer ought to receive in value of manure 12s. 8d. This is the estimated value of the food remnant calculated upon the market prices of the fertilising ingredients

which it contains. You will, therefore, see the necessity of looking after the manure heap and trying to prevent the ammonia escaping. This can be brought about by using a fixing agent, as sulphate of iron or gypsum.

In reply to a question Mr. Robinson said that by rolling and harrowing his fallows in the autumn he had caused the weeds to start quite a fortnight earlier than some of his neighbors, but he did not advocate rolling after the seed is sown. Mr. Smith and other members agreed that it is hardly possible to harrow land too much, provided it is done when the soil is neither too wet nor too dry. Mr. Reid said he had not grown a decent crop for the last fourteen years, but this year, with the aid of manures, he was certain he would have abundance of hay and a good crop of wheat too if nothing injured it. Several members said they would use heavier dressings of manure than they had done in the past. Mr. Hains recommended all farmers to visit Mr. Robinson's farm. Mr. Robinson stated he had obtained a splendid crop on red, stiff soil from the use of Thomas phosphate, but the same manure on light land gave poor results. Farmers should try experiments to find out what manures best suited their various soils and conditions.

Bute, September 4.

Present—Messrs. H. Schroeter (chair), W. H. Sharman, E. Ebsary, J. H. Barnes, A. Schroeter, D. Green, M. Stevens, W. Hamdorf, R. C. Commons, S. Lamshed, M. Hall, and A. Sharman (Hon. Sec.).

SEEDS.—Mr. Schroeter said the only seed received from the Central Bureau which had been successful last year with him was Budd's rust-resistant wheat.

GRUBS.—Mr. Stevens said about sixty acres of his wheat crop had been destroyed by "grubs" [Query—Caterpillars?—GEN. SEC.], and forty acres were badly affected. Oats growing alongside were not attacked. Mr. Green said a farmer near Watervale had spread lime around a place affected by the "grubs," and the insects had not crossed it.

Penola, September 8.

Present—Messrs. E. A. Stoney (chair), T. H. Morris, W. Miller, S. B. Worthington, J. A. Riddoch, E. McBain, H. Ricketts, Dr. F. Ockley, and R. Fowler (Hon. Sec.).

REGISTERED EARMARKS.—Members are of opinion that a well-devised and vigorously administered system of registered earmarks for sheep would work well and prevent sheepstealing.

Johnsburg, September 8.

Present—Messrs. G. H. Dunn (chair), F. W. Smith, W. McRitchie, T. Potter, F. W. Hombach, J. Sparks, H. Napper, T. A. Thomas, T. Thomas, M. P. Read, T. Johnson (Hon. Sec.), and three visitors

LOCUSTS.—The Hon. Secretary directed attention to the myriads of young locusts (or so-called "grasshoppers") existing in the district. He had tried ploughing around a piece of wheat-field about to be attacked, and this kept them in check for a time. Mr. T. A. Thomas said that our climate was probably not sufficiently moist to favor the propagation of the fungus disease which is reported to be so successful in checking the increase of locusts in South Africa. The Chairman had some hope that heavy rains would occur and destroy the newly-hatched insects.

RABBITS.—Chairman reported rabbits increasing at an alarming rate, and urged united and vigorous action to prevent serious damage. If this were done the pest could be kept down to a great extent. It had been argued that poisoning was not efficacious whilst there is green feed available; but he believed poison is successful at any time, if properly done. He favored laying the bait on the "buck-heaps," or else turn up some fresh earth to attract the rabbits. Mr. Chalmers thought twigs or branches of sandalwood poisoned with arsenic (? strychnine) was the best bait; but he was now using bisulphide of carbon, and asked if it was likely to be more effectual if set fire to in the hole? [No; and it is highly dangerous to do so.—GEN. SEC.] Mr. Potter suggested digging out the burrows. Mr. Napper said it is best to saturate cotton waste with the bisulphide of carbon, place it well within the burrow, and then close it up to prevent access of fresh air. The fumes would permeate the whole tunnel and asphyxiate the rabbits. All the small entrances to the burrow should first be stopped up. Phosphorus and sulphur mixed had much the same effect as bisulphide of carbon. Mr. McRitchie had used toxa in water with success. [Too dangerous.—GEN. SEC.] He had good results from phosphorus, pollard, and bran, mixed with sweetened water, scattered in pellets in a new plough furrow or freshly-turned up soil.

Riverton, September 8.

Present—Messrs. W. Hannaford (chair), D. Kirk, T. Gravestocks, W. Davis, J. Kelly, A. S. Martin, and H. A. Hussey (Hon. Sec.)

HAY-GROWING.—Members perused the paper on this subject as read by Mr. H. A. Davis at the late Congress of Bureaus in Adelaide. Further consideration postponed.

NOXIOUS WEED.—The so-called "wild onion" has put in an appearance here. [The *Asphodelus fistulosus*, or "wild onion," is a noxious weed under the Act, and it is the duty of the district council to enforce its destruction. It is really a nasty weed, difficult to eradicate when it has got a good hold, and ought to be dealt with at once.—GEN. SEC.]

BONEDUST.—In answer to inquiry members were informed that the highest class bonedust should contain 52 per cent. of tribasic phosphate and about 4 per cent. of ammonia. Medium bonedust contains about 45 per cent. tricalcic phosphate.

Mundoora, September 7.

Present—Messrs. R. Harris (chair), W. D. Tonkin, J. Blake, W. Mitchell, W. Aitchison, D. Owens, H. Haines, T. Watt, W. J. Shearer, and A. E. Gardiner (Hon. Sec.).

STRIPPERS.—Whilst it is necessary to secure the best stripper, members agree that this is a difficult matter, because one will contain a patented improvement which cannot be used with another stripper which also includes other patents not available in rival machines, so that no machine can be perfect in all points. Members were unanimous in the opinion that a field trial of strippers is very necessary, to prove which is the most suitable, most enduring, lightest in draught, and most perfect in thrashing. In answer to a question the Chairman considered wide teeth in the comb are an advantage, being less liable to choke or to waste grain. Others agreed with this. Mr. W. Haines remarked that a machine which looked well on the show ground might not work satisfactorily on the field; but a practical proof of its qualities on the field trial would be of advantage both to the maker and the purchaser.

BLACK RUST.—The Chairman reported appearance of a little black rust (*Urocystus oculata*) in his early wheat. Mr. Aitchison said he noticed that Early Para is rather subject to this disease, and he found Newman to be less liable. Mr. Blake agreed. Members agree that it will well repay all farmers to closely watch developments and results in all varieties of cereals. Mr. Aitchison proposes to report later on upon a plot of Petatz Surprise wheat he has now growing.

Mylor, September 15.

Present—Messrs. E. J. Oinn (chair), P. P. Probert, Wm. Nicholls, W. J. Narroway, T. J. Mundy, J. Nicholls, R. H. Antuar, W. H. Hughes, F. G. Wilson, A. Wilson, W. G. Clough (Hon. Sec.), and seven visitors.

SEASONABLE WORK.—Sow all varieties of melon, pumpkin, squash, cucumber, tomatoes, onions, and other vegetables. Spray trees. All other business was merely routine.

Port Elliot, September 24.

Present—Messrs. J. McLeod (chair), W. E. Hargreaves, J. Nosworthy, F. T. Fisher, H. Pannell, R. E. Ullrich, J. Brown, and E. Hill (Hon. Sec.).

WORK OF BRANCH.—Members agreed to abide by a ballot to decide who shall in rotation read a paper or bring forward a subject for discussion at successive meetings. [There are a few of our Branches which are rather barren of useful results, but if the members would graft on something of the above principle we might secure a heavy harvest of good fruits.—GEN. SEC.]

EXHIBIT.—Mr. Brown tabled plant of King's Early wheat, sown May 20, 3ft. high, in ear, solid straw, yields heavily for hay, and is much liked by horses and cattle.

CONGRESS.—Mr. Brown said the recent Congress of Bureau was the best he had attended in regard to numbers and eagerness of members to take part in the debates.

COMMERCIAL FERTILISERS.—Mr. Brown stated, with respect to comparisons between guano and guano super., that so far as money value is concerned there is no difference, but, taken weight for weight, the difference is in favor of guano super. In his opinion, $1\frac{1}{2}$ cwt. guano super. is equal to 2 cwt. guano.

Crystal Brook, September 1.

Present—Messrs J. C. Symons (chair), P. F. Claridge, G. Davidson, W. Hamlyn, P. Pavy, W. Pavy, W. Natt, A. Hamlyn, W. J. Venning, F. S. Keen (Hon. Sec.), and three visitors.

STANDARD SAMPLE OF WHEAT.—Paper by Mr. Venning on this subject was read and discussed. While the majority favored the 63lbs. standard, a few members were of opinion that 64lbs. would not be too high, as the value of our wheat in the European market would be enhanced if the standard were higher. It was suggested that it would be a good plan to have a depôt where our wheats could be properly cleaned and graded for export. Members agreed that the harder wheats were more valuable in England than the soft wheats.

TRIAL OF REAPERS.—A committee was appointed to arrange for field trial of reaping machines.

EXPORT OF BUTTER.—Members were of opinion that it would be better if farmers' butter were made up in bulk in each locality and forwarded; the returns would be better than if the cream were sent to the city factories. There is such a difference in the qualities of the cream sent or in the made-up butter from each farm, that it is impossible to get a uniform bulk sample.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of September, 1900 :—

Adelaide	1.18	Hoyleton	1.57	Macleodfield	2.82
Hawker	0.37	Balaklava	1.89	Meadows	2.81
Craddock	0.29	Port Wakefield	0.63	Strathalbyn	2.10
Wilson	0.42	Saddleworth	2.00	Callington	1.30
Quorn	0.81	Marrabel	1.63	Langhorne's Bridge..	2.23
Port Germein	0.97	Riverton	1.95	Milang	2.32
Port Pirie	0.89	Tarlee	1.52	Walleroo	0.98
Crystal Brook	1.84	Stockport	1.59	Kadina	1.23
Port Broughton	1.55	Hamley Bridge	1.03	Moonta	0.93
Bute	2.11	Kapunda	2.13	Green's Plains	1.49
Hammond	0.75	Freeling	1.97	Maitland	1.29
Bruce	0.49	Stockwell	2.05	Adrossan	0.88
Wilmington	1.93	Nuriootpa	2.36	Port Victoria	1.05
Melrose	1.96	Angaston	2.87	Curramulka	1.00
Booleroo Centre	1.26	Tanunda	2.11	Minlaton	1.01
Wirrabara	2.19	Lyndoch	2.23	Stansbury	0.94
Appila	1.52	Mallala	1.38	Warooka	1.50
Laura	2.01	Roseworthy	1.76	Yorketown	1.18
Caltowie	2.32	Gawler	1.86	Edithburgh	1.20
Jamestown	2.04	Smithfield	1.38	Fowler's Bay	0.97
Gladstone	2.16	Two Wells	1.02	Streaky Bay	1.28
Georgetown	2.50	Virginia	1.09	Port Elliot	1.91
Narridy	2.81	Salisbury	1.00	Port Lincoln	2.49
Redhill	2.36	Teatree Gully	2.31	Cowell	0.92
Koolunga	1.70	Magill	2.03	Queenscliffe	1.30
Carrieton	0.87	Mitcham	1.93	Port Elliot	3.60
Eurelia	1.24	Crafer	3.36	Goolwa	2.13
Black Rock	0.92	Clarendon	3.08	Meningie	1.76
Orroroo	0.89	Morphett Vale	1.69	Kingston	1.72
Johnburgh	0.73	Noarlunga	1.38	Robe	1.35
Petersburg	1.41	Willunga	2.14	Beachport	1.06
Yongala	1.50	Aldinga	1.44	Bordertown	1.84
Terowie	1.33	Normanville	1.95	Wolseley	1.60
Yarocowie	1.40	Yankalilla	2.61	Frances	1.53
Hallett	2.31	Eudunda	1.47	Naracoorte	1.53
Mount Bryan	1.94	Truro	1.62	Lucindale	1.91
Burra	1.69	Mount Pleasant	2.02	Penola	2.05
Snowtown	2.04	Blumberg	2.66	Millicent	1.66
Brinkworth	1.57	Gumeracha	2.81	Mount Gambier	1.97
Blyth	1.18	Lobethal	2.68	Wellington	1.94
Clare	3.02	Woodside	2.35	Murray Bridge	2.24
Mintaro Central	1.45	Hahndorf	2.51	Mannum	1.37
Watervale	3.15	Nairne	2.73	Morgan	0.70
Auburn	2.10	Mount Barker	2.99	Overland Corner	1.52
Manoora	2.34	Echunga	3.10	Renmark	1.15



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY

(C. C. CORNISH, SECRETARY).

Labor Bureau.

Number of Persons Registered, and found Employment by Government Departments and Private Employers, from August 28 to September 28, 1900.

Trade or Calling.	Number Registered.		Number found Employment.
	Central Bureau.	Country Agencies.	
Laborers and youth laborers	70	201	288
Carpenters and carriage makers	6	—	15
Bricklayers and masons	—	—	5
Plasterers	—	—	4
Painters	11	—	8
Blacksmiths	2	—	4
Boilermakers	—	—	2
Strikers	1	—	2
Fitters	5	—	7
Cleaners	18	8	1
Carriage washers and junior porters	40	13	12
Apprentices	18	5	1
Rivet boys	1	—	—
Cook	—	—	1
Farm hands	—	—	2
Camel driver	—	1	1
Compositor	1	—	—
Baker	3	—	1
Miner	1	—	—
Groom	1	—	—
Totals	178	228	354

September 28, 1900.

A. RICHARDSON, Bureau Clerk.

General View of the English Factories Acts.

CONTRIBUTED BY INSPECTOR BANNIGAN.

(Continued from page 192.)

SAFETY.

A.—Machinery.

The Acts require special precautions to be taken with regard to the cleaning of machinery in motion, with regard to employment about a self-acting machine, and with regard to the fencing of machinery.

Machinery is of two kinds—mill-gearing, by which power is transmitted, and the manufacturing part, by which the work is actually done. Children may not be allowed to clean any part of machinery of either kind while it is in motion by the aid of steam, water, or other mechanical power. Young persons may not be allowed to clean any dangerous part of machinery while it is so in motion. There is a presumption (until the contrary is proved) that any part is dangerous if the inspector notifies it to the occupier to be dangerous. There is no restriction on the cleaning by women of the manufacturing part of machinery. Neither young persons nor women may be allowed to clean any part of mill-gearing while it is in motion for the purpose of propelling any part of the manufacturing machinery.

Children, young persons, and women may not be allowed to work between the fixed and traversing parts of a self-acting machine, while the machine is in motion by the action of steam, water, or other mechanical power. No person employed in a factory (of whatever age or sex) may be allowed to be in the space between the fixed and traversing parts of a self-acting machine, unless the machine is stopped with the traversing part on the outward run; but that space does not, for the present purpose, include the space in front of a self-acting machine. In any factory erected after the beginning of 1896, the traversing carriage of a self-acting machine may not be allowed to run out within 18 in. of any fixed structure, not being part of the machine, if any person is liable to pass over the space over which it runs out.

The following parts of machinery in a factory must be securely fenced:—

1. Every hoist or teagle;
2. Every fly-wheel directly connected with the steam or water or other mechanical power, whether in the engine-house or not;
3. Every part of any water wheel or engine worked by steam or water or other mechanical power;
4. Every wheel race not otherwise secured;
5. Every part of the mill gearing;
6. All dangerous parts of the machinery of whatever kind.

The machinery under the first four of the above heads must be fenced, whatever may be its position or construction. Under heads 5 and 6 fencing is unnecessary if the mill gearing or other machinery is in such position or of such construction as to be equally safe to every person working in the factory as it would be if it were securely fenced.

All fencing must be constantly maintained in an efficient state while the parts required to be fenced are in motion or use, except when they are under repair or under examination in connection with repair, or are necessarily exposed for the purpose of cleaning or lubricating, or for altering the gearing or arrangements of the parts of the machine.

There are two cases in which, on application being made by an inspector, a court of summary jurisdiction may interfere, by means of summary prohibitions, to protect the safety of workpeople. The first is the case of any premises used as a factory or workshop (or as a part of a factory or workshop) which are in such a condition that any manufacturing process or handicraft carried on there cannot be carried on there without danger to health, life, or limb. In such a case the court may prohibit the use of the premises for the purpose of that process or handicraft until the necessary steps have been taken to remove the danger. But proceedings may not be taken under this provision in cases where the local authority have power to act under the Public Health Acts, unless the local authority have made default, and the inspector is consequently empowered to act in their place. This provision would apply to danger arising from defective condition of walls or ceilings, or other parts of the structure, or from inadequate ventilation.

The second case in which an order of summary prohibition may be obtained is the case of a machine used in a factory or workshop which cannot be used without danger to life or limb. The court may either absolutely prohibit the use of such machine or require repairs or alterations to be made, and prohibit the use of the machine till they are made. In case of imminent danger to life the court may take an interim order prohibiting the use of the machine, either absolutely or subject to conditions, until the case can be heard and determined.

B.—Fire.

The provisions of the Acts which require precautions to be taken against fire in factories and workshops make a distinction between old and new buildings.

Every factory erected since January 1st, 1892, and every workshop erected since January 1st, 1896, in which more than forty persons are employed, must

be furnished with a certificate from the sanitary authority (in London, from the County Council) that reasonable provision has been made for the escape, in case of fire, of all persons employed on stories above the ground floor. It is the duty of the sanitary authority (or County Council) to examine every such factory and workshop, and to supply the certificate if they are satisfied that reasonable provision has been made.

In every factory or workshop erected after January 1st, 1896, the doors in each room in which more than ten persons are employed must, except in the case of sliding doors, be constructed so as to open outwards.

With regard to every factory erected before 1892 and every workshop erected before 1896, it is the duty of the sanitary authority (in London, of the County Council) to ascertain whether the factory or workshop is provided with reasonable means of escape, in case of fire, for all persons employed on the stories above the ground floor. If the sanitary authority (or County Council) find that any such factory or workshop is not provided with such reasonable means of escape it is their duty to serve notice on the owner, requiring him to take before a certain day the necessary steps for providing proper means of escape. The owner is authorised to take the necessary steps in spite of any agreement with the occupier, and any question arising between the owner and the occupier as to whether the occupier should bear or contribute towards the expense of complying with the notice may be settled in the county court for the district. In case of a difference of opinion between the owner and the sanitary authority (or County Council), either party may, on application within a month after the time when the difference arises, require the matter to be referred to arbitration. The arbitration is to be conducted according to the rules in the first schedule to the Act of 1891. The award may either discharge, amend, or confirm the notice. If there is no difference of opinion, or if the notice is confirmed or amended by the award, the owner is required, under penalty, to comply with the requirements of the notice.

If the sanitary authority (or County Council) fail to perform their duty with regard to requiring proper means of escape from fire, the factory inspectors may give notice to them, and in case they fail to take the proper steps within a month, the inspectors may take the proceedings which they might have taken, and recover the expense from them. The sanitary authority (or County Council) are required to inform the inspector of any proceedings taken by them in consequence of the inspector's notice.

The reasonable means of escape referred to above do not, either in an old or in a new factory or workshop, include the provision of movable fire escapes. But where an inspector is of opinion that movable fire escapes are required for the safety of the persons employed in a factory or workshop, he may apply to a court of summary jurisdiction, and the court may, by order, require the occupier to provide one or more of such fire escapes.

While any person is within a factory or workshop for the purpose of employment or meals, neither the external doors, nor the door of any room in which any such person is, may be locked, bolted, or fastened in such a manner as not to be easily opened from the inside.

Report on English Factories and Workshops.

The annual report of the Chief Inspector of Factories and Workshops for the year 1899 has been issued as a Blue-book. It states that trade generally was active, and hence there were more premises to be registered and inspected. There were also more accidents to be investigated, and this is in accordance with the experience of previous years, which leads to the expectation of heavier lists of casualties in times of industrial activity. Accidents reported under the Factory Acts were more numerous in 1899 than in any previous year, but the rate of increase during the year was much less than in 1898. So

far as accidents reported to the certifying surgeons are concerned, the increase was again relatively greatest among adults and males. The decrease in accidents to children observed in 1897-98 was not continued, there being, on the contrary, some increase in 1898-99. While the minor accidents reportable only to the inspectors increased 25·2 per cent., from 38,335 to 47,989; the number reported also to the certifying surgeon advanced 18·4 per cent., from 19,227 to 22,771; and the fatal accidents 19·8 per cent., from 727 to 871. On the whole, therefore, the increase was less marked in the more severe forms of injury, but only under the head of "loss of sight" was there actual decrease, and in that group the numbers are small. The total of reported accidents in 1898 was 57,562, and that in 1899 70,760, being an increase of 13,198, or 22·9 per cent. In the previous year there was a notable increase in the number of accidents in connection with machines and engineering, shipbuilding, and warehouses. This was continued, but in a much less degree in 1899, and in shipbuilding the advance was relatively less than in the average of all trades. In the reports of the superintending inspectors there is much interesting detail as to the causation and prevention of accidents. Substantial progress has been made in the fencing of circular saws. Mr. Beaumont and Mr. H. S. Richmond (H.M. Superintending Inspectors for the North-Eastern and North-Western Divisions respectively) completed their inquiry into the dangers attending the use of machinery in the several branches of the cotton manufacture. Their report, published in 1899, shows that the United Kingdom is behind other countries in this respect, and particularly in the fencing of machinery by the maker, which is the most economical and effective plan. Another point to which reference is made in the reports is the beneficial result of the action taken by some of the accident insurance companies in requiring to be satisfied of the efficient guarding of the dangerous parts of machines. On the other hand, there are, as in former reports, many allusions to the carelessness of workmen and frequent opposition on their part to the use of safety appliances. In regard to industrial poisoning, it is stated that cases of plumbism were, on the whole, fewer, and this was owing mainly to the decrease in the number of reports in connection with potteries; but there was also a marked diminution under the sub-heads of glass-making, file-cutting, and melting. There was increase, however, in some of the other industries, especially in the manufacture of white lead and paints and colors, and in the "miscellaneous" group of minor lead industries. For the third year in succession there was no reported case of industrial arsenic poisoning. Fewer instances of phosphorous necrosis were reported, but anthrax became much more prevalent, especially in connection with horsehair and hides and skins. Mercurial poisoning appears in the list for the first time. The special attention of the staff has been given to manufacturing processes in which dust or fumes are generated and are inhaled by workers to a dangerous extent, and to the enforcement of such efficient means for the abatement of these conditions as may be reasonably practicable. The question is one of the greatest moment to the health of the persons employed in such works, and, while great advances have been made in this matter under special rules and under the general powers of the Factory Acts, it is evident from the reports received that there is need for more systematic action, and for closer attention to the efficiency of the means adopted for mechanical ventilation according to the special circumstances of each case. There were 3,574 prosecutions under the Protection of Children Acts, of which 3,406 ended in convictions; eighty-four were withdrawn on payment of costs, and eighty-four were dismissed.—*The Times*, 5/7/1900.

Journal of Agriculture

AND

Industry.

No. 4. REGISTERED AS NOVEMBER, 1900. [A NEWSPAPER. VOL. IV.]

NOTES AND COMMENTS.

October has again proved fatal to the hopes of many of our farmers. Up to the 22nd of the month scarcely a single station in the Northern districts had recorded more than ten points of rain, while hot dry winds were generally experienced. These, catching the wheat at a critical time, blighted very large areas of promising crops, which, instead of being left for wheat, have since been cut for hay. The late crops have also suffered severely, and although the cool cloudy weather experienced for the past two weeks has been favorable to the filling of the heads, many crops will scarcely come into ear without a good rain shortly. The bulk of the crops in the Lower North and Southern districts will return a fair yield, but the average looked for a month ago will not be realised. In some of the outlying districts practically no grain will be harvested.

The succession of hot winds during the second week of October seriously affected the crops in many districts, and reports in the daily papers that the manured crops have suffered most are common. That the application of the fertilisers in quantities of 1cwt. and less per acre will render the crop more liable to injury from hot winds is exceedingly doubtful; in fact, the experience of the past few years has gone to show that the manured crops stand the dry weather best. Every farmer knows that the wheat when just coming into ear and flowering is very tender, and should frost or hot winds occur then it suffers greatly. May this not be the explanation of some of the manured crops suffering more from the unusually early hot winds this season? It is well known that the manured crops are earlier than the unmanured, which fact usually tells in their favor, but this year they have in some cases been too early. When damage from frost or hot winds occurs it is often stated that certain varieties suffer most, and the question of resistant varieties crops up. In most cases, however, the question of which varieties escape injury will depend to a very large extent on the state of the crop at the time of the frost or hot winds. A few days earlier or later would affect the vitality of either or any of the varieties that happened to be in blossom.

Deplorable accounts are to hand of the damage done by the locusts again this year. Many unfortunate farmers in the outlying districts have seen the locusts destroy all the feed and crops that the dry seasons had spared. Owing to the immense areas of poor pastoral country abutting on the agricultural areas it is difficult to see what effective action can be taken to prevent or mitigate the ravages of this pest. The country is too dry to allow of any

reasonable hope of success from the use of the locust fungus, and the destruction of the hoppers or the eggs in this outside country is not possible. It is very probable that the locust will not do so much damage to the orchards and gardens in the Lower North as last year, owing to the presence of grass and other food. It is reported that the gardens north of Port Augusta have, however, been completely stripped by them.

Referring to a request made by the late Congress of Agricultural Bureau, the Railways Commissioner states that manures are already carried at lowest rates, that is 7s. 4d. per ton for 100 miles. With regard to demurrage on loaded trucks he says he cannot possibly agree to extend the time for which a truck may lie at a station under load without charge, though every consideration is given in the case of consignees living at long distances from the station. According to the *Leader* the Victorian fertiliser freights are somewhat higher and the New South Wales charges much lower than South Australian.

When it is recommended to cultivate deeper someone jumps on the speaker or writer and says "It will ruin the field to turn the subsoil on to the surface." As this is *not* recommended the man who objects is only "running a herring over the trail." There is much profit to be derived from *gradually* deepening the arable soil—except possibly where the subsoil at a depth of 3in. consists of limestone rubble. The lower soil, or subsoil, should not be turned on the surface; but if an inch of it can possibly be mixed with the top soil all the better.

Another misrepresentation is often made. It is often asserted that it has been recommended to sow *all* fallowed land with summer and autumn fodder. The recommendation is to sow a goodly portion so as to provide plenty of nice feed for the cows and other live stock. It is not too late, in all parts where rainfall has been moderately good, to sow maize and all kinds of sorghums.

Most farmers will be pleased to note the improved tone of the wool market. The bidding at the second sale of the season was considerably brisker, and better prices were obtained. Although the rise was only $\frac{1}{4}$ d. to $\frac{1}{4}$ d. per pound for the better classes of Merino wool, growers will doubtless accept it as an evidence of an upward tendency, and hope for better prices in the near future. Very many appear to be holding back their wool either for shipment to London or for the later sales here, in the hope of better prices. It is generally admitted that the prices last season were forced up too high, and as a consequence the pendulum has gone to the other extreme. With so large a proportion of our farmers keeping sheep the condition of the wool market is of vital interest to them.

Intending shippers of apples to England should make a point of securing space at an early date. Hobart exporters will take all the space that the mail companies can give, but up to the 30th November space is kept open for South Australian shippers, and after that date none will be available. One of the greatest difficulties in the past has been to get the growers to secure necessary space in time, and on more than one occasion this has to a certain extent placed them in the hands of agents who have secured space for speculative purposes, and who naturally make the growers pay them for their risks.

It is to be hoped that some of our fruitgrowers will try the effect during this month of spraying a very weak solution of carbolic acid on a number of their apple and pear trees for the purpose of preventing attacks of codlin moths on the fruit. Use $\frac{1}{2}$ pt. carbolic acid and 1 lb. soap to 12 galls. water. It is supposed that the moths are guided by the aroma of the fruit when about to deposit their eggs, and if this is so the odor of the weak solution of carbolic acid, or even a resin wash, would probably so overpower the aroma of the fruit that the moths would be unable to find any whereon to deposit their eggs.

A potato-grower at Mount Gambier has forwarded to the Agricultural Bureau a plant which is spreading rapidly in his land. He states that last year he noticed it first, and as it grew well during the summer he thought it would prove a valuable fodder. This year, however, it is growing very vigorously in the potato crop, so much so that he has resorted to hand-picking to get rid of it. The plant proves to be the dreaded "Nut grass," (*Cyperus* sp.), probably the most pernicious weed in cultivated ground. It spreads very freely both from the seeds and from the tubers or nuts which, as in this case, are distributed through the land by the cultivating implements. It is also freely distributed in the soil around plants sent away from infested gardens. It is probably correct to say that there is no absolutely effectual means of eradicating the weed once it gets a thorough hold, so that cultivators should spare no trouble in attacking it directly it appears. In small patches continual digging and hand-picking, keeping fresh stable manure on the ground, renewing frequently for twelve months or more, continually cutting off the plants and other means to prevent the plants maturing their leaves, may be adopted, or smothering crops may be grown during the summer. In the December, 1899, issue of this journal an illustration and description of the weed appeared.

Cabbages are usually condemned as cowfeed owing to their alleged effect on the flavor of the milk. At the recent Conference of Branches at Cherry Gardens Mr. Strange, an enterprising orchardist and dairymen, stated that he fed his cows on cabbages directly after milking, and the milk from these cows was unaffected by any taint. The milking was usually done out in the paddock, so that the surroundings were favorable. In the annual report of the New Zealand Department of Agriculture it is stated that 40 tons to 50 tons of cabbages per acre have been grown at the Wyndham Experimental Farm and fed to cows with most satisfactory results. Up to 20 lbs. was given to each cow night and morning with the result that the increase of butter averaged 1 lb. per cow. As cabbages will grow and produce heavily under proper treatment dairymen in the Hills districts might give this matter some attention.

The present season has been exceptionally favorable to the increase of fungus diseases. It is many years since peach curl-leaf (*Exoascus deformans*) was so virulent, it being no uncommon thing to see trees almost denuded of foliage, or with nearly every leaf "curled." A few growers who sprayed their trees at the proper season with strong Bordeaux mixture report only slight attacks. Apricot shothole is also bad in many parts, and we fear that those orchardists who neglected to spray their apple trees will find the apple scab affect the fruit.

The occurrence of these diseases is another illustration of the old saying that "It's an ill wind that blows nobody any good," as the careful orchardist who can supply good clean fruit will be able to sell at reasonable prices, while the scabby fruit will be difficult to dispose of at the lowest rates.

Of over 16,000 peachgrowers consulted by the United States Department of Agriculture by circular a great majority replied that "peach curl-leaf may be prevented with an ease, certainty, and cheapness rarely attained in the treatment of any serious disease of plants, and there is no longer a necessity for the losses annually sustained from it in the United States." The remedy is spraying with winter strength of Bordeaux mixture when the buds begin to swell.

The *Australasian* tells that "amongst other proposals in the agricultural policy of the M'Lean Ministry is the adoption of the British system of offering premiums for the services of stallions in country districts with a view of encouraging better classes of horses than are now generally bred on farms. About thirty premiums of 150 guineas each will be offered, and if the sum named be supplemented by the local agricultural societies sufficient attraction for many of the best horses in the colony will be offered, and, furthermore, it will be an inducement to import fresh blood."

The Victorian Minister of Agriculture is reported to entertain another progressive idea—that is to establish an Agricultural Bureau for that colony upon similar lines to that of South Australia. It is some years since the settlers at Lillimur, Kaniva, Nhill, and Bendigo were unanimous at public meetings in their desire to have this Bureau inaugurated. It is to be hoped that the constitution of the Bureau will be strictly non-political; else it will be greatly crippled, if not slain outright.

Bots in horses have already proved to be very troublesome in Victoria and Tasmania, and last year were reported as being present in our South-East. The United States Department of Agriculture publishes a statement that a farmer in Georgia tried a great many experiments with numerous so-called remedies, which, with one exception, were useless. The one exception was an infusion of crushed tansy plant in cold water given to a badly-affected horse in the morning, followed by a dose of Epsom salts in the evening. The next morning the horse had voided a pint and a half of dead bots. Tansy (*Tanacetum vulgare*) is a common garden plant, and is intensely bitter.

Dehorning of a full-grown steer or cow may or may not cause a lot of pain to the animal for the time being, just as a certain other necessary surgical operation does with respect to male cattle, sheep, and horses; but the advantage to mankind who keep the animals almost demands that such operations should be performed. Still, there seems to be far less inhumanity in *preventing* the appearance of horns on calves by rubbing lunar caustic on the shells when the animals are under a month old.

Millions of useful birds, including wild ducks of all kinds, turkeys, crows, magpies, plovers, larks, &c., have been poisoned throughout the Australian colonies by the baits laid for rabbits. Some have been killed by feeding upon the carcasses of the rabbits, but by far the greater number with grain and pollard dosed with arsenic, or strychnine, or phosphorus. It is a dreadful thing to kill so many innocent and extremely useful birds in the effort to destroy a four-footed pest, and it remains to be considered whether sandalwood twigs and other articles which would be attacked by rabbits and left untouched by birds should be used in place of bran, grain, pollard, &c.

Like the crows, spiders cause some annoyance, but they are better "friends to humanity" than some human beings profess to be. Some of them spin webs with which to entrap their prey, and the good housewife objects to the dirty appearance of those artistic productions; but the webs in the dwelling-house, as well as in the orchard and vineyard, catch no end of insects which would either bite the owner or eat up the product of his labor. Not mosquitoes alone, but all kinds of moths (producing myriads of caterpillars) and other injurious insects, along with some that are beneficial, are caught in these webs. Those who keep bacon, cheese, &c., in cellars, if they are wise, will encourage web-spinning spiders to the fullest extent, as they catch the flies which cause "jumpers" in those articles.

It is most important to remember that seeds of the best specimens of every kind of cultivated plant should be selected regularly each season. If a special selection of the best of these selected seeds were made and grown in a nursery-bed, something very good would in a short time be developed. All the sorghums and most of the varieties of maize will soon deteriorate if the seed is simply harvested and resown year after year.

HOMERIA COLLINA.

BY M. HOLTZE, DIRECTOR BOTANIC GARDENS.

This plant, belonging to the family of Irids or Flags, has been recently repeatedly sent from several parts of the colony for identification, and is reputed to be injurious to stock. The plant is a native of the Cape of Good Hope, where several varieties of it are found, and from where it has been introduced to gardens as an ornamental bulbous plant. The variety mostly met here is the smaller flowered, orange-red one, and it is generally known here as *Bobartia aurantiaca*. As, however, the name *Bobartia* belongs by right of priority to a cyperaceous plant, this name must not be continued in its connection with the poisonous *Homeria collina*. The plant is easily recognised by its bright orange-red flowers, standing from two to four together on a reed-like stem. The root is a roundish corm or bulb of the size of a hazel nut, covered with a coat of dry, fibrous skins. The stems have a few narrow grass-like leaves, the lower one of which is taller than the stem, and attenuated into a generally shrivelled up long point. The flowers are about 1½ in. in diameter, with six flower-leaves, which are curved down, of equal size; color, bright orange-red with yellow throat. The filaments stand tubulous around the pistil. The stigma is tongue-shaped, slightly higher than the anthers, which are linear oblong, sessile, and pressed to the stigmas. The fruit is a dry capsule, obsolete prismatic, about 1 in. long and ½ in. thick.

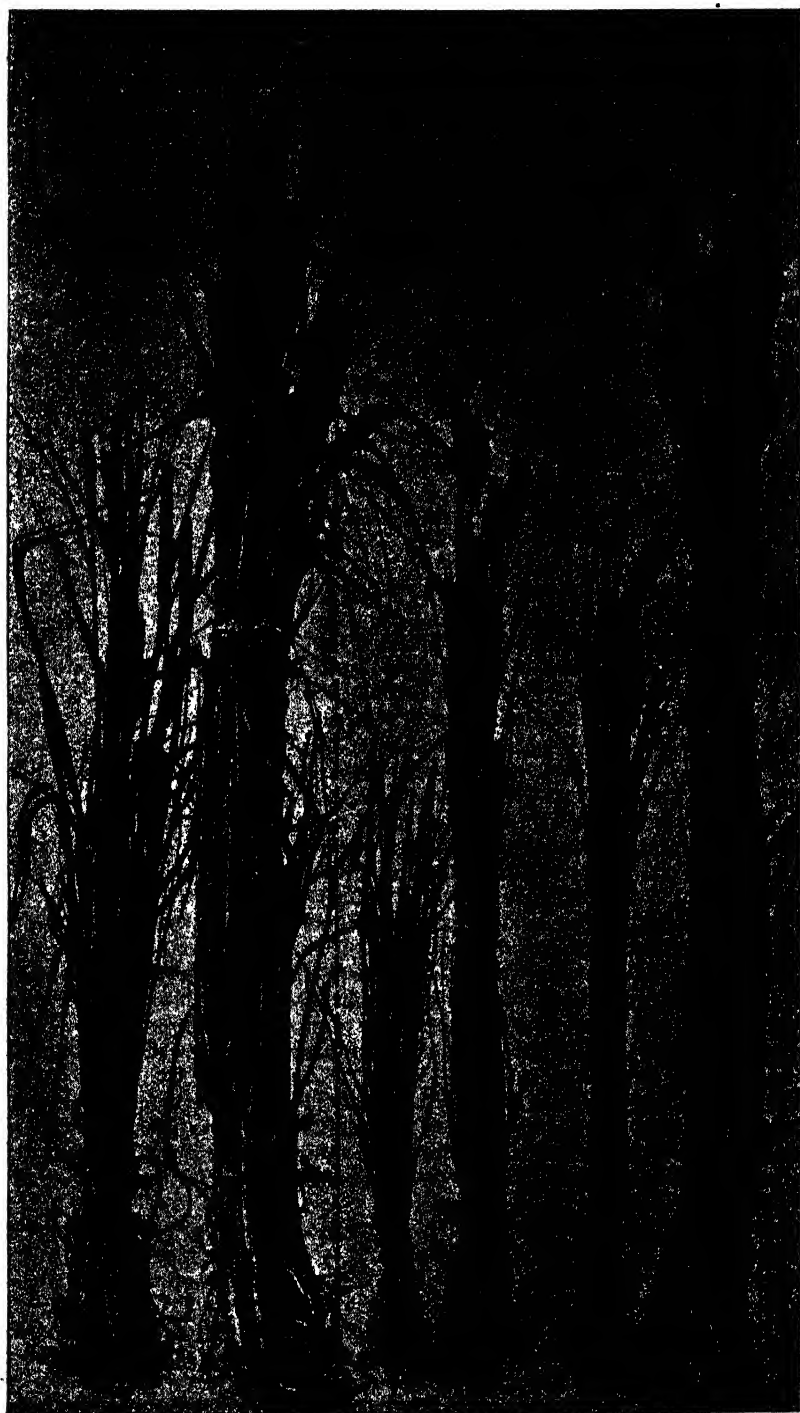
COMMERCIAL FERTILISERS FOR WHEAT IN THE FAR NORTH.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

At the recent Congress of the Bureau, held in Adelaide during September, Mr. A. F. Noll, of Quorn, showed samples of wheat grown with and without the aid of commercial fertilisers. So much interest was manifested in the effect of manure on the crops in the far northern farming areas, that I wrote to several farmers whom I knew were carrying out experiments, asking for information as to results.

Mr. A. F. Noll, of Quorn, writes that he sowed his plots during first week in April, the weather being fine and the soil moist and in good working condition, nearly $1\frac{1}{2}$ in. of rain having fallen the previous week, and $\frac{1}{2}$ in. was recorded on April 14th. The soil was of a poor, red, sandy nature, and was fallowed early the previous year, scarified, and harrowed. In the accompanying illustration the result of the use of the fertiliser is shown in a marked degree, the specimens photographed being fair averages of the different plots. The total rainfall from January 1st to September 7th, when the samples were gathered, was 7·64 in., of which 1·66 fell prior to seeding. In the illustration the specimens numbered 1 and 1A are Purple Straw wheat, No. 1 being drilled in without manure, and No. 1A with 80 lbs. English super. per acre; 2 and 2A are samples of Allora wheat, unmanured and manured respectively; 3 and 3A are Petatz Surprise wheat. The Allora, being later, has not done so well as the other two, but in each case the beneficial effect of the manure is marked. The plots varied in size from one up to nearly six acres, and up to October 8th were very promising, but the hot dry spell during the following week seriously affected the crops, both manured and unmanured, so far as the yield of grain was concerned.

Messrs. A. and J. McColl, of Kingswood, have this year drilled in 180 acres, all except fourteen acres being manured with English super. at the rate of 75 lbs. per acre. One paddock of 135 acres of fallowed land was put in between April 4 and 20 with Red Straw, Dart's Imperial, Allora, Petatz Surprise, Baker's Early, and Bartlett's Crossbred. Baker's Early, a bearded variety, proved the earliest of all, and had suffered slightly from frost. It was a good even crop, with well filled ears, and, under ordinary circumstances, should have yielded 16 bush. per acre; but, owing to the succession of hot dry winds, it was being cut by the binder on the 19th October. Petatz Surprise was not so early, but the heads were filling well. Bartlett's Crossbred was early and promising. Allora was the most promising of the lot. Dart's Imperial was later, but looking well. Sixty acres consisted of Red Straw wheat, a fine even well-headed crop, earlier than Dart's Imperial, but not so early as Allora. One width of Dart's Imperial wheat had been drilled in without manure, but the difference was scarcely noticeable until looked at carefully, when the unmanured strip was found to be considerably thinner and not so forward as the rest. In another paddock, sown a little later, the manured wheat was in every case more forward and better than that drilled in without manure, though on the richer soils the difference was not so marked. The crop drilled in without manure was better than that where the seed was broadcasted and scarified in. The land on which the experiments were carried out was fallowed in August of last year, harrowed immediately afterwards, and scarified and harrowed again before sowing. The rainfall to October 18 was 10·81 in., of which quite 3 in. fell before the crop was put in. Although there is not much difference in the height of the manured and unmanured crops, Messrs. McColl are satisfied that the extra return from the use of manure will prove profitable.



Mr. H. M. Borgas, of Hawker, used English super. on grey bluebush land, which was fallowed in August, 1899. Seed was sown on April 12, the soil being dry. The rainfall from January, to October 10 was 8·7in., of which over 3in. fell prior to seeding. Thirty-seven pounds of seed and 60lbs. super. were sown in the manured plots, on which the wheat was nearly 2ft. in height; that on the unmanured plots being several inches shorter. The main difference, however, was in the thickness and weight of crop, the weight of crop (green) taken from the manured land being fully three times that from unmanured of equal area. The spring has been so dry that it is feared that in this district the farmers will not get back their seed, though more will be obtained from these manured plots.

Several public school teachers in the outlying districts were supplied by myself with various kinds of fertilisers for trial, but the season has been so exceptionally dry that practically no crop at all has been obtained; no comparison can, therefore, be made of the results. The season has borne out the contention of many growers in these dry districts, that while the manured crops may give better returns, the seasons are so unreliable that the farmers dare not risk the extra cost involved in the use of fertilisers. Where the fertiliser has to be carried so far by rail the extra outlay comes to 6s. to 7s 6d. per acre, which the farmer cannot afford to lose.

AGRICULTURAL SHOWS.

Some two or three years ago Professor Lowrie created quite a consternation amongst the committees of country agricultural societies when he read a paper at a Bureau-Congress on "Country Shows," in which, amongst other things, he suggested a curtailment of their number, with a view to increasing the usefulness of the remainder. In some quarters, also, quite a howl of indignation was raised because the worthy professor pointed out that some societies did not confine their operations to the legitimate objects which the holding of shows is supposed to have in view. On more than one occasion we also have in our pages condemned in no measured terms some of the items included in some of the programmes (such as buck-jumping contests), apparently for no earthly reason than to gratify vitiated tastes, or to increase the gate money.

We now have before us the programme of another society, in which is included a number of bicycle races, and money is offered as prizes which could have been much better applied to the increase of the prizes offered for the best draught entire or the best bull for dairy purposes. We have no objection to bicycle races, but must most emphatically denounce their intrusion into the agricultural shows, as likely to have a deteriorating effect on all and everything connected with the show.

We do not know if the Government subsidy is claimed and paid on the money given as prizes for these bicycle races, but if it is, a gross injustice is done to those societies which conduct their shows on legitimate lines, and we are quite sure that such subsidy is not in accordance with the intention of the legislature which votes it.

Country societies are subsidised *pro rata*, according to the amount of prize money which each pays away, consequently it is quite evident that if some get more than they are justly entitled to other societies must suffer, as the parliamentary vote is a fixed and not a variable amount.

If bicycle races are a legitimate item on a show programme, then it only remains for some of the bicycle clubs to put one or two horse events on their sports programme, and they can with equal right claim subsidy on the whole of the money paid away as prizes. Of course they might have to alter the name

of the club to something indicative of an "agricultural" society, but that difficulty would easily be surmounted if likely to be profitable. The same remarks apply to other competitions absolutely foreign to the true purpose of agricultural shows.

Committees of agricultural societies should be satisfied with the privileges they enjoy, and not abuse them. An abuse of privilege often leads to a curtailment thereof, and through such curtailment the innocent often have to suffer equally with the guilty.

POULTRY NOTES.

BY D. F. LAURIE.

I have been asked very often why I am such a persistent advocate of utility poultry as distinct from those breeds which have a claim to fancy points merely, and which have been favorites for many years. It may be pointed out that this is not a fancier's journal, and that what is required is an explanation of breeds and methods which will prove profitable to adopt extensively. Many works on poultry put the case so well for each breed and variety that the novice is often puzzled to decide which he shall adopt, and very often keeps as many varieties as he can obtain specimens of. This sort of thing generally ends in failure. I often notice at country shows that a person or persons will exhibit in nearly every class; it is safe to say that there are few first-class specimens, and rarely are good ones bred by such exhibitors. My object has always been to advise the culture of certain breeds of proved value. Many of these breeds have sub-varieties which differ merely in marking, but retain the main characteristics. It will be found on investigation that quite a large show could be held consisting of utility birds only. In the following list—any of which is good for egg laying or table-bird breeding—are some which are either rare or not obtainable in Australia, but doubtless all will be available some day.

FOWLS.

Laying Breeds.—Ancona, Minorcas (both black and white), Andalusians, Leghorns (white, black, brown, buff, pile, duckwing, cuckoo), Houdans, Hamburgs (gold-spangled, silver-spangled, black) — I omit gold and silver pencilled as they are too small. Thus there are fifteen kinds of layers, which would provide sixty classes, that is, one each for cocks, hens, cockerels, and pullets; with decent entries a good show of these alone could be held.

Table Birds and general purpose, or all round breeds, make a lengthy list as follows:—Dorkings (colored white, cuckoo, and silver-grey), Indian Game, Langshans (black—the genuine—and white and blue), Orpingtons (black, both single and rose combed, and buffs), Wyandottes (black, white, silver, gold, buff, partridge), Plymouth Rock (barred, white, buff, partridge), Old English Game (at least a dozen or more), Malays (at least a dozen). Here we have forty more, which might fill 150 or more classes. I give these particulars to show that those who wish to combine exhibition, breeding, and fancy points generally can find ample scope in over 200 classes which might be available of utility fowls alone. I have included Malays, although they are far behind Indian Game or Old English Game, either pure or crossed, for table purposes.

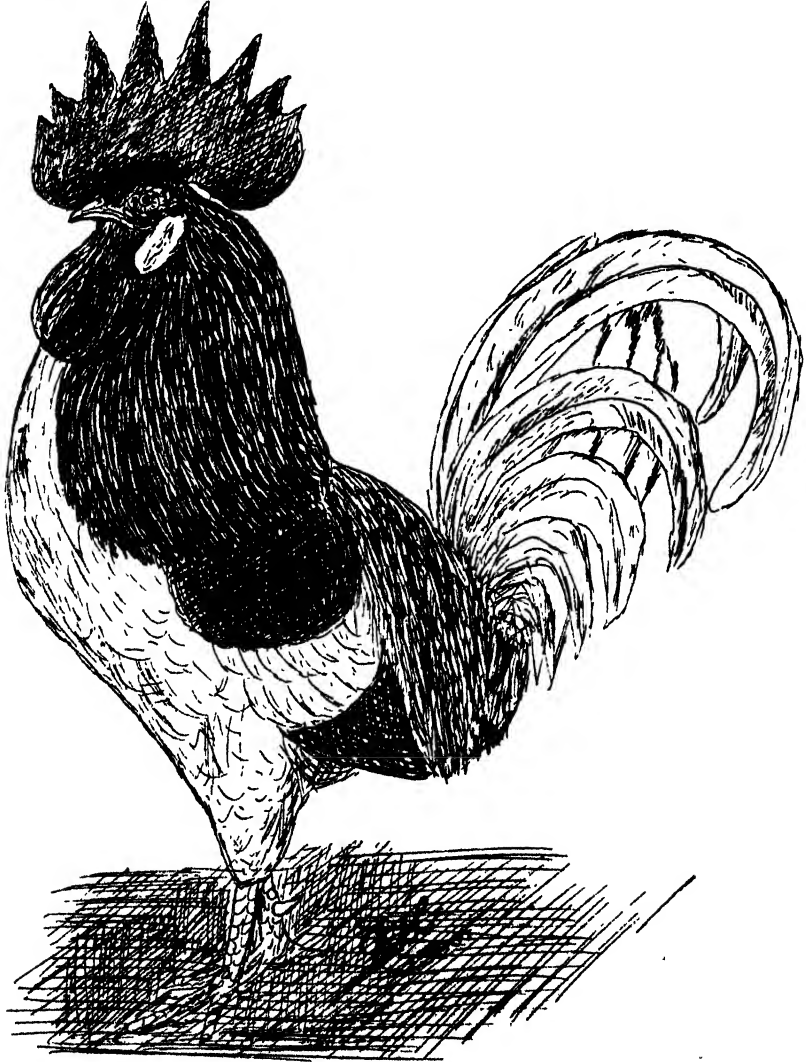
Ducks.—Aylesbury, Pekin, Indian Runner, Rouen, Cayuga. These would supply twenty classes.

Geese.—Toulouse, Embden, White China, and Brown China; in all, sixteen more classes.

Turkeys.—American Bronze, Black Norfolk, White Cambridge, and Buff; sixteen classes.

Last, but by no means least, is the Guinea fowl, a hardy, profitable bird, very easy to rear and a grand forager.

The modern game fowl is not a utility breed, but sentiment will keep this breed to the fore. I may state, however, that the sentiment is quite misplaced, as it is the Old English Game that was the mighty warrior, the winner of mains and tough battles, not the long-legged half brother to a native companion or a stork. The old favorite, the Spanish, is now looked on purely as a fancy fowl and attracts little attention.



THE PILE LEGHORN COCK.

In view of what I have written, I have made a drawing of a typical Pile Leghorn. It will be seen that it is precisely similar to other known breeds of Leghorns, differing only in marking, which should be that of a richly-marked

Red-pile English Game. Several specimens have appeared at Adelaide shows or in the other colonies. Good specimens are very handsome, but of course their main point is correct marking and rich color. A mixed mob would, while proving very profitable as layers, not present such an attractive appearance as a similar mob of whites, or even browns. As regards Duckwing Leghorns, which are very popular in England, the breeders have already divided them into two classes—the golden duckwing and the silver duckwing. I know a good number of my readers have a strong leaning towards high-class exhibition poultry, and this is to be encouraged in every way, as the better the birds the greater the profits. If the aim is always towards improvement, rational methods will increase the utility as well as the fancy points, and it is by no means unreasonable to say that any breeder can, with care, raise a large mob of high-class profitable birds. From such a mob the majority could, by careful preparation, occupy a foremost place in high competition. It is necessary to mate your birds carefully, and with a definite purpose, for if you go merely for fancy points the utility of the bird is endangered, and if you altogether neglect the standard points you will soon have a hopeless lot of mongrels. Poultry and pigeons multiply so rapidly that deterioration becomes very marked in a short time. Those who have read Darwin's "Origin of Species" will remember that the eminent scientist selected pigeons to prove his theory of reversion to a former type which modern domestic animals are prone, and in numerous instances the progeny in time reverted, or, as it is commonly called, "threw back," to the wild blue rock pigeon. Those who know anything are convinced of the importance of maintaining the standard, and, if possible, improving it for this very reason. I never heard of a case in which domestic poultry of any breed was so perfect that like produced like for successive generations, nor does such a case ever occur. It must be remembered that all modern breeds are more or less mixed, and in all cases some ancestor exerts its prepotency, and there is always a tendency for that influence to exert itself, with the result of a reversion to that original. Certain breeds, the result of combination, have become fixed, and remain so through artificial selection, but if allowed to breed haphazard would go back to an original common type, just as domestic rabbits of various sorts in time revert to the common grey bunny. For this reason when we look at an ordinary mob of farm fowls we see that (always supposing there has been no addition of fresh blood for some years) they are of a general type, much favoring the jungle fowl in size and character, and presenting few (if any) points common to modern pure breeds. In a paper I read some six years ago, at a meeting of the South Australian Poultry Society, on the Langshan fowl, I advanced these reasons in support of my contention that the pure Langshan is an ancient and distinct breed of great prepotence. Typical specimens direct from China would breed true for many generations. On this point, however, we must not forget environment, food, climate, &c., as all these have a tendency to cause variation in type as well as color and marking. There is very much more to be said in favor of advocating pure breeds and the maintenance of the standard of perfection. Several persons try to prove that no other than utility points are necessary in poultry kept for profit. This is most misleading. Laying is more a question of strain than breed, but certain breeds are famous for laying, and such breeds should be selected as the foundation of a flock of high-class layers, which can only be produced by careful selection. Further, as these breeds have proved good layers, we must continue to breed the like, and therefore must keep to the standard. There is a tendency to reversion in some breeds, which seems strongly marked in these colonies, especially in the table bird classes. Particularly is this noticed in the matter of size and certain developments. Here we find the imperative need of maintaining the standard.

There is a great future before the poultry industry; but in these days of competition it behoves all to study the most approved methods of breeding, &c. The highest classes of all sorts, whether for laying or table, are those only which will really give a good return, and no breeder should be content to extract a pittance from an inferior flock of mongrels. The general producer will find it far more profitable to give proper attention to a small mob of first-class "working birds" than to a miscellaneous mob of non-producers. The majority of breeders keep their poultry instead of the poultry keeping them. The matter of adjustment lies in the power of the owner and breeder.

The *Australian Poultry Gazette* says, speaking of Victorian poultry exports:—"South Africa presents a payable market for dead poultry, for the department has dispatched 3,000 cases, containing fifteen birds in each, or a total of 45,000 birds. These shipments have been made during the last four or five months. The birds consist of young fat hens and chickens, from 4 to 15 months old. These facts are sufficient justification for what has appeared in these columns again and again: that the export trade is the thing for the poultry industry, for the industry is cramped and localised where there are no outside markets. It will be news to many of our readers that there are agents in Melbourne ready to purchase suitable birds for export; but they say that it is impossible to get birds of a uniform good quality in sufficient numbers to suit the requirements of the trade. Our farmers must learn to breed better classes of fowls. They must get out of the idea that because a *fowl* is a *fowl* it is good enough. Intelligence and energy must be brought to bear upon this industry, and the best should be used for stock purposes. Mongrels will never build up a busy export trade, but judicious breeding will if persevered with."

These remarks bear out what I have often said: like New South Wales, Victoria is far ahead of South Australia in poultry exports.

POISONING FOXES.

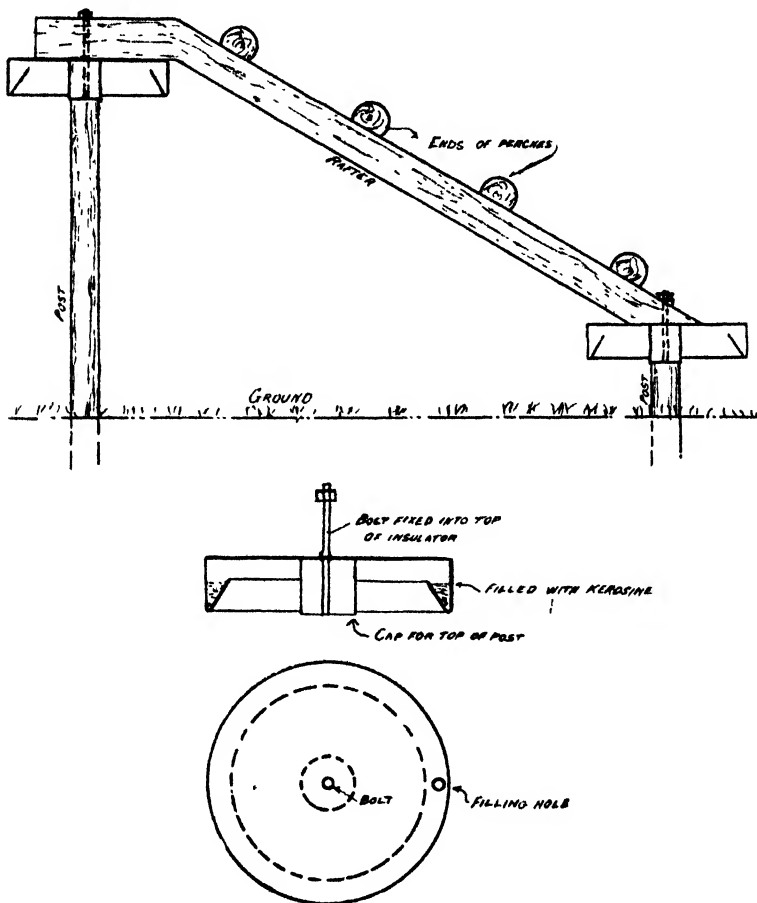
In preparing bait for poisoning foxes the most important point is to avoid touching the bait with the hands. Use a hardwood stick, the end of which has been sharpened and scorched in fire to remove taint of the human hands. The knife used for cutting up the bait should be stabbed into soil several times for the same purpose. Birds make excellent bait, the skin being torn off with care not to touch the flesh. Clotted blood, liver, or mutton are liked by foxes. Bait should be about an inch diameter; make a small slit with the clean knife, open it by aid of the stick, place in the slit no more of the strychnine than can be lifted on the point of a small penknife. It is usual to drag a fresh sheepskin flesh side downwards in a zigzag direction over a good length of ground—better still, in close vicinity to a shallow plough furrow—and cover the baits with grass sod. This prevents ants and birds getting at the baits, and they can readily be picked up again if necessary. In place of a sheepskin, the paunch, or a portion of the carcass of a freshly-skinned sheep, or half a dozen rabbits will serve as a drag.

The baits should be carried in a box, lifted out with a hardwood skewer that has previously been scorched. The strychnine should be the pure uncolored article. Again observe that the hands must not come into contact with the baits in any way.

It is useful to place a bell with strong strap around the neck of one ewe amongst each 200 sheep, and do not keep too many sheep in each flock.

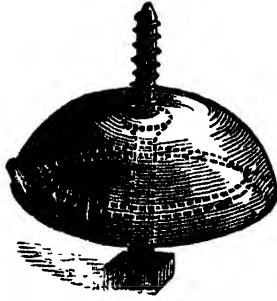
ANT-PUZZLERS AND TICK TRAPS.

Mr. George Matthews sends the following illustrations of a contrivance designed by Mr. Iredell, but manufactured by himself, for the purpose of preventing fowl-ticks (*Argas reflexus*) gaining access to the perches on which fowls roost at night:—



There can be no doubt that this plan is effectual, though rather more costly than that of suspending the perches or roosts by wires from the roof—such wires being enwrapped with kerosine-saturated cloth or wool. Four posts are to be fixed in the floor of the fowlhouse, two short and two taller. These are to be capped with the tick traps, the flanges inside or beneath, which are partly filled with kerosene through a hole in the top, and the two rafters which are to support the perches are fixed by screws projecting through the centre of the trap. [In the original design, furnished to Messrs. A. Simpson & Son, the rafters were to be simply retained in place on top of the traps by flanges; but, after seeing samples of "Heath's ant-puzzler," the bolt and nut were substituted.—ED.]

Without throwing any doubts upon the originality of the first design, which is both ingenious and eminently practical, it is almost identical with a prior invention by the late Mr. Heath, a gardener at "Birksgate," which is patented, and is still made and sold by Messrs. A. Simpson & Son, Adelaide, under royalty to the widow of the inventor; the difference being that the "ant-puzzler" is intended to screw under the legs of meatsafes, hivestands, &c., and is half globular on top, whilst the "tick trap" is intended to fix on tops of posts or stumps to carry rafters, and is, therefore, flat on top. In both cases there is a flange in a hollow beneath for holding kerosine. The annexed is a rather poor illustration of the "ant-puzzler," loaned by Messrs. A. Simpson & Son.



ADMINISTRATION OF MEDICINE TO ANIMALS.

The following extracts from an article in the *Farmer and Stockbreeder*, by H. Leeney, M.R.C.V.S., deal with this important matter to stockowners :—

How to Give a Ball.

Giving a ball is really a very simple matter, yet how comparatively few horseowners or their grooms can be relied upon to give medicine in this convenient form? It is only fear of an unmeasured danger that prevents anyone from becoming expert in this matter, and with but little practice. The serious preparations most people make when about to give a ball defeat the object by creating alarm in the mind of the patient, who should find the bolus in a position from which he cannot reject it before he has become aware of any unusual attention.

A plain hempen halter, hanging loose, is all the apparatus required, unless one includes an old kid or dog's skin glove on the right hand, which should be already on the hand before the patient is turned round in the stall. As every horse at some time or other has his mouth opened—to look at his age, and daily to receive the bit—he should not be alarmed thus far in approaching him with a view to seizing firmly hold of the tongue with the left hand, and instantly turning the point upwards in such a manner that, if a gelding or entire, the tip of the organ will be touching the tusk in the upper jaw. If this is done quietly, but quickly, the mouth presents itself as a funnel, up which the right hand is rapidly passed, and the ball left behind. The hand, with the thumb in the centre, and the ball held between the fingers, is not such a large obstacle that it cannot be passed up the mouth of any but the smallest ponies. It is absolutely safe from being crushed by the patient's molars so long as the operator's left hand firmly grasps the tongue and keeps it pointing upwards. Scratching the knuckle of the first finger is avoided by the use of a glove.

The control of food or other bodies in the mouth does not extend beyond that part of the tongue where it is most arched in shape and at its greatest

thickness. A ball, then, should be placed as far back as this portion. The involuntary muscles act upon the morsel, whether of food or physic, when it passes the rough boundary line above indicated, and in most cases has to be swallowed; not in all, as some individuals acquire a knack of holding the ball, which they cannot easily eject, until a more convenient season, then to make use of the muscles of the cheek and tongue in a manner at no other time noticeable, and resulting in movements which indicate the animal's intentions.

To guard against those cunning old customers who presently drop the ball, the halter lead, which was hanging loose before giving it, should be quickly wound round the mouth immediately above, or even pressing upon, the nostrils. This little precaution generally decides the waverer, especially if the nostrils are depressed in the manner of the mother who pinches the baby's nose to induce him to swallow the teething powder. The operator meantime watches the channel of the horse's neck on the near side, where he will see it bulge as the ball passes down the first third, but something like half-way down, the gullet ascends above and continues its course behind the windpipe, and the moving mass is lost sight of. Some horses, while holding a ball, will swallow their saliva or a pellet of food which was previously in the mouth, and in advance of the ball, and this movement down the channel of the neck may deceive the novice. The passage of a ball is, however, much more marked and prominent, and a person who has never seen one go down before will involuntarily exclaim, "There it goes," if he is asked to watch for it. The old rogue who has coughed back balls before, finds it very difficult to do so if the rope lead is wound round his mouth, and where there is any doubt he may be offered a go-down of water. If a horse drinks or takes food immediately after giving him a ball, the attendant can be quite sure he has swallowed it, as one can if a dog licks his nose after a pill.

Giving Draughts or Drenches.

Medicines in the form of draughts or drenches can never be superseded, and it is often desired to give fluids with a view to immediate entrance into the circulation, and such agents as alcohol, æther, and ammonia must be largely diluted. What has been said in regard to the restraint of the animal in preparation for a ball applies to some extent when a draught has to be given. A quiet man will often succeed alone in drenching a horse or cow where several with twitch and stable fork and much coercion fail.

If the patient is made to stand with his left or near side close to a wall, and the operator is not short or the horse very tall, he may often succeed in holding up the patient's head just above the level, and pour in little by little the required dose from a champagne bottle or other one of the strong and sloping shouldered variety.

It may be taken as an axiom that a horse should be drenched slowly and a cow as fast as you like, provided that in the latter you give warning by touching the palate of the cow with the neck of the bottle.

It is true that cows are more frequent sufferers from medicines going the wrong way, but it is, in my experience, due either to neglect of the warning that something is coming, or else to tipping up the bottle, and dividing the draught into sips, as we do with horses.

Bottles have very generally superseded the old-fashioned horn, which was not without its advantages in being unbreakable, but much more medicine was impartially distributed over the persons engaged when horns were in vogue. Tin bottles combine several good points in not being easily broken, in having depressions for the finger and thumb, in the length of neck, and the easy flow which a tube ventilator affords. Like the horn, it is not so easily cleansed from drenches containing insoluble matters, and certain acids and other substances

act upon the metal which would not affect glass. The worst of all accidents that can happen with a bottle is to get the neck crushed between the teeth of the patient, but easy as this would appear, it is hardly ever known to occur.

It is certainly an advantage to be able to see the contents of the vessel from which medicine is being administered, and this cannot be done in any but a glass bottle.

Electuaries.

In dealing with acute sore throats, neither the time-honored draught nor the ball is suitable as a form of medication, for either is liable to bring on a paroxysm of coughing and perhaps choking.

Suitable medicines may then be mixed with honey, glycerine, or syrup, to the consistency of ordinary jam, and being placed upon a flat instrument, as a long paper-knife, smeared upon the back of the tongue.

Powders.

These are dearly beloved of the incompetent, as they can be thrown upon a damped feed of corn and chaff or mixed with a bran mash, but they have the great disadvantage that things pungent or nauseous will not be eaten. Individuals differ very much as to what they will eat in the way of drugs. Some turn up their noses and display the most evident disgust at a little sulphur and nitre, while others will make no objection to such malodorous drugs as asafetida and copaiba. The powder is most useful where sheep in large numbers require medicinal agents, and they are not so fastidious as horses or cattle. Bitterness seldom disgusts, as so many food plants are bitter.

This enables us to give such unpleasant drugs as Epsom salts in food, and such bitter tonics as gentian and calumba, bark, and even sulphate of iron, if nicely masked with salt and fenugreek, or other favorite condiments of neat cattle.

Methods of Restraint.

We have described the giving of a ball, but not provided for the operator's safety if the patient happens to be pugilistic and strike with his front feet. This vice is the most dangerous of any, and a known striker should be prepared with kneecaps and stood up to a wall, while the "medicine man" gives the ball from the other side. Where such conveniences do not exist, or for other reasons, a ball or draught must be administered in the patient's own box or stall, a good old-fashioned plan is to put a collar on, and attach to it a sack containing a couple of bushels of corn. The weight and bulk suspended in front of him makes it impossible to strike a person or injure himself.

The Twitch

so unnecessarily resorted to by many stablemen may, in some cases, be excusable, but in most instances affords more assistance (if the loop is large) when put in the mouth and used as a means of holding the head up, instead of that dangerous but common practice of forcing it up with the tine of a stable fork inserted under some part of the head, collar, or halter. Gentle traction on the tongue, when the animal refuses to swallow, has more effect than stroking the windpipe outside, as one generally sees practised. Pulling it out and letting it go suddenly invariably results in a gulp of more or less of the medicament. Some horses are subject to vertigo when the head is held up for long together, or any great angle, and the writer has been more than once knocked over when drenching such subjects. If the drink is a "long" one, an interval may be allowed, but before the animal is permitted to depress his head the man should be very sure he has not been holding the fluid in his mouth. If it is necessary

to use mechanical power in raising the head of an obstinate horse, the cord or pulley, hook should not be attached to a fixed point, as it is better to lose a dose of medicine than run the risk of breaking the patient's neck.

In drenching horned stock the neck should be kept straight, and this can only be done when two persons engage in the act. If one does it alone he naturally obtains more power by pulling the head round to himself, and this makes the animal much more liable to choking. The practice of putting the finger and thumb into the nostrils should be avoided if possible, as the membrane covering the septum is frequently wounded by the man's nails, is painful to the animal, sometimes sets up an ulcer, and always affords a gate of entrance to the blood stream of disease germs.

HORSE - BREEDING.

By courtesy of Dr. Harris Browne the following has been culled from publications loaned by him concerning the Holsworthy and Stratton (England) Agricultural Association's scheme for improvement of horse stock. The society was promoted by A. Scott Browne, Esq., Buckland Pilleigh, Highampton, and it has established a registered stud book, of which the first volume for 1900 is just published. The rules and conditions under which entires and mares can be registered are as follow :—The entires must be of some distinct pure breed, and travel or stand within certain fixed limits or areas. They must be passed sound each year between January 1st and the third Wednesday in February by a fully qualified veterinary surgeon, nominated by the society. Where an entire has been exhibited and passed "sound" at the Islington show, and a certificate is given by the secretary that the horse was passed as sound at the show, the same will be accepted by this society as a guarantee of soundness for the same season. The owner of any stallion that has served during preceding year must give to the hon secretaries a certificate that the animal is fruitful, signed by six landholders or tenant farmers. Any stallion possessing the above qualifications may be registered on his owner sending to the society's hon. secretaries a description of the horse, with particulars of route and fees to be charged, not later than the last day of February. When once registered the stallion will remain on the society's register till the last day of December of the same year. For the first year, 1900, the society pays expenses of veterinary examination, and makes no charge for registration. The qualifications for registration of mares are that they shall be owned by residents within a fixed area; they must be passed sound by one of the veterinary surgeons nominated by the society. No fees charged for veterinary examination or for registration during years 1900-1-2, and once examined and passed will remain good on books for the three years. A list of hereditary diseases, compiled by the Royal Veterinary College, London, is supplied to each of the veterinary surgeons nominated by the society, and the word "sound" signifies (for both stallions and mares) that they are free from any of the hereditary diseases named in that list. As soon as there are sufficient young stock in the district descended from registered parents the society proposes to hold a sale, which will probably result in breeders obtaining enhanced prices for their horses.

Attached to the register of stallions for 1900 are some valuable practical rules for the treatment of mares before, during, and after service, taken from the book of the Compton stud, under management of Capt. Fife and Capt. B. Hornby. The following is extracted therefrom :—

Sending Mares to the Horse.

It is a great advantage to send mares (that visit the horse for the day) as early in the day as possible.

When a mare is sent to the horse it is a great advantage that her usual attendant, or the same man that took her to the horse on previous occasions, and who knows her symptoms, should be sent with her. When this cannot be done a note should be sent giving particulars of when the mare was seen in season, and whether likely to be coming on or going off. Mares are too frequently sent with boys who can give no information whatever about them.

Stinting and Trying Mares.

All mares vary in their habits; allowances must be made accordingly. The first step is to catch the mare on season; some mares will show it unmistakably, while others will never show any signs unless they are tried by a stallion. A mare, therefore, should be properly tried by some local stallion every week.

The mare having been caught on season and served, she will not require looking to for fourteen days; she might, therefore, be sent home if the distance is not inconveniently far for her to return on the fourteenth day. Every succeeding seven days the mare must be tried again until after the seventh week dated from the mare's service; should she refuse the horse for that time it may be concluded that she is in foal. Should she, on the other hand, take the horse a second and third time, the same attention will be required for seven weeks dating from the last service. The most common time for a mare to turn is at three weeks, and a mare usually remains on season a week; but some are short seasoned mares, and remain on for a few days only, and in cold seasons they do not remain in use so long as when it is warm weather.

It is better to send mares a day or two after they come in season, and not the first day they appear to be so; but it is best to have a mare dead on season and not to delay till she is not thoroughly kind. A mare that has foaled should be sent to the horse on the ninth day, counting the day she foaled as the first day. For instance, if a mare foaled in the morning of May 1st she should go to the horse on the 9th of May. When this day cannot be managed she should be sent on the eighth or tenth day.

Mares should be tried fourteen days after service and every week afterwards for seven weeks after the last service. Owners frequently will not take the trouble to have their mares tried regularly after service, and, consequently, if the mare turn it is not found out till too late; she has to go barren, and the fees and time spent on her are thrown away, all for want of a little attention. If a thing is worth doing at all it is worth being done properly.

Treatment before and after Service.

Mares should not be too highly fed; beans and vetches should be especially avoided. A mare that is over fat is often difficult to get in foal. Mares should under no circumstance be stood in the stable with, or turned out to grass, in the same or next field to a gelding for some weeks after being served, as the latter will often tease the mare and prevent her holding or taking the stallion properly; and mares that have been fed on hard food and kept in hot stables should be prepared for stud purposes a week or two before being sent to the stud farm. They should have a dose of physic, and then be fed on roots and bran, or grass, and gradually cooled down to stand without clothing in an airy or open box. It often happens that owners complain because their mares keep turning to the horse, and the cause invariably proves to be their running mares and geldings together in the same field. Breeders cannot be too careful in this respect with their mares.

Sending Mares by Road.

It is not advisable to send mares too long a distance to the horse and back again on the day of their service—that is to say, twenty or thirty miles, but twelve or fifteen will do no harm. A mare after service should be walked quietly home, and not be over-worked or overheated for some days at least. They may be sent a long distance and served same evening, and return quietly next day or day after, or return in two days. Mares that have, say, twenty miles to go to the horse by road, when they have foaled, could on the eighth day after foaling be sent ten miles with the foal.

Mares for Breeding Hunters.

A mare to suit thoroughbred stallions should be bony and thick, and on short legs, for it is from the dam's side that bone and substance should be found to combine with the quality of the thoroughbred sire. In some instances valuable hunters have been bred from cart mares, but a cart mare to be suitable should have good shoulders—not back of the knees, should have great bone, should have good feet, and above all have her toes straight, and stand true on her legs—she should be very short legged and long, and of course have as many good qualities as possible; if she carries her tail high instead of the usual drooping rump of the cart mare this would be a great point in her favor, as would also be the setting on of the head and neck. Breeding from cart mares is, however, very speculative as to results; you may breed a great many too short of quality before you breed one good one. I should, rather than recommend the cart mare pure, prefer one of the fillies sired by a thoroughbred horse out of a cart mare, or a mare of the stamp such as might be expected from that cross, but I am sure that another cross again of the thoroughbred would give a better prospect of success; in fact, there is no doubt but that the more crosses of the thoroughbred in the mare the more certainty

there will be of breeding valuable stock, except when the mare be too small and weedy. It is better to select a mare low in stature with true formation than a tall animal, narrow or leggy, or wanting in limbs. A brood mare should have good action, and should be free from hereditary diseases.

Mares that Pay to Breed from.

Breed from the best, not from something indifferent simply because you happen to have it. If your mare be not good enough to win prizes she should be one which can be made useful for slow work, or a three-year-old filly should be bought and put to the horse—she would throw a foal at four years old, after which she should be sold at a considerable profit on her three-year-old price, and there would be the foal to sell as well. It does not pay to keep a mare exclusively for breeding, unless she be exceptionally good looking; otherwise she should be one that can be made use of, or she should be young and growing into money. The latter class of mares will throw the strongest foals, and it will not be the slightest detriment to them. It is disappointing to find so few farmers have followed our advice in this, but in preference continue to breed from under-bred and very moderate brood mares, when there are plenty of young mares in this country that might be bought for the purpose cheap enough and sold after at a profit.

It is a great mistake for a farmer to breed a horse with no other object than that of its being adapted for his own common use only. If he breeds horses he should aim at breeding the best for the market, and if he miss that mark the animal is then useful for common general purposes.

Mares Proving in Foal after all.

Owners must not conclude that their mares are not in foal because they in some cases seem to come in season. It is of frequent occurrence that mares apparently come in season after they are in foal, but each time they do so they should be sent to the horse to be tried. Every year fresh instances arise of owners writing that their mares are barren, and they afterwards prove in foal. In one case the owner hunted his mare within a month of her foaling because he thought she was empty. Under such treatment nine mares out of ten would have slipped foal, unknown perhaps to the owner, and a barren mare be recorded against the stallion. And recently an experienced breeder sent his mare to the stud in February to be served by the horse, and she foaled the following May, being in foal all the time. Owners should never hunt a mare or treat her as barren until the end of January.

Mares Foaling.

SYMPTOMS.—Mares frequently foal before their time; they should, therefore, a month before the time, be shut up by themselves at nights; but they should on no account be kept entirely confined in a box when they are in foal. They should have a run out, if only for an hour or two every day. If this be not attended to, small, weak, deformed, or dead foals will be the consequence. A month before a mare's time is due, if the weather be cold, she should be brought in under cover at night, and should be seen every day so as to observe any change in the appearance of her udder. Some mares do not drop their udder until only a few days before foaling, and such mares require great attention, and the attendant must then be guided by the dropping of the quarters, which usually takes place about two days before foaling; but, as a rule, the udder begins to show about a fortnight before, and in some cases three weeks. The udder continues to increase until wax appears; this, a yellow substance, remains on the fronts of the teats about a day, and when it drops off milk begins to show and continues dropping away. As a rule the mare will foal within ten hours of the change from wax to milk. In some cases the mare will wax and the wax drop off without being followed with milk; she may then go some time before waxing again, perhaps a fortnight, or three weeks in some cases. When the milk once appears the mare then wants looking to every hour or so, and the next symptom is the mare will begin to look uneasy and smell about, and she may then be expected to foal at any time, and should not be left more than ten minutes or quarter of an hour.

ATTENDANTS.—It is of great importance that the mare should be accustomed to one attendant before foaling, so that she may not be nervous at his coming in and out, and great caution should be observed at this time by the attendant that he should come in very quietly in case the mare should be down foaling, in which case she might get frightened and jump up. It is advisable to let a mare foal in a place with as much room as possible, and in case, when the door opens inside, it is best to have another way of getting into the box, as she might be down against the door, and no one could then get to her. The mare, if not watched, might, for instance, go down to foal with only one or two feet from her tail to the side of the box; in such a case she would have to be got up, and she would then go down again; or if the mare had got half through her foaling, if help could be got, she might in some cases be pulled round by the tail so as to allow room from the wall.

TREATMENT. When the mare commences to foal, the first thing that should appear is the water bladder, which comes out until the fore feet have come out far enough for the attendant to take hold of them. He then breaks the bladder with the finger, and taking hold of the legs

may gently assist the mare by pulling quite straight and steadily, just at the times when the mare heaves. As soon as the foal is born the string should be tied close to the colt's belly, and it should be cut close to the tying. The next thing is to draw the foal up to the mare's head, and let her smell and lick it, and she may given a little oatmeal gruel before she gets up; she may then be left for half an hour, after a which some warm mash may be given, and while she is eating it the foal should be taught to suck by holding its head to the teats and placing one in its mouth; it takes two men to do this, one to hold the foal behind. As soon as the foal has sucked, the mare and foal may then be left to themselves, and the quieter the better, but before leaving the attendant should see that the foal has dunged and passed water, as this is a matter of great importance. In case of a bad mother, or where a foal has to be reared by hand, cow's milk given to foals should be mixed with a little pepsine.

EXCEPTIONAL CASES.—The above is an outline of the general treatment of mares, without going into any details of the various complications that might occur, such as a foal coming wrong, hind legs first, head doubled back, when it will generally be found that the bag as a rule does not appear first, as in the natural course; but in any cases of irregularity a veterinary surgeon should be sent for at once. If a mare, after she goes down to foal, should seem to have difficulty, and be unusually long without any satisfactory results, a veterinary surgeon should be sent for. In natural cases of foaling a mare should not be longer than half an hour or so in labor, though in many cases the foal is born in ten minutes.

Foal's Treatment.

WEANING.—Foals should be taught to eat crushed oats before being weaned; they will then miss their weaning much less than otherwise. They should be well fed the first winter; it is of far more importance to them than any other winter, and in the end less oats go a longer way. They will make much more growth afterwards in consequence of being well done at first. If not thoroughly well kept the first year what is lost can never then be regained, and it may just have made the difference between a bad and a good colt. Breeding will never pay those who will not liberally feed their colts the first winter. Foals, yearlings, and unbroken colts may be forced on in condition by a few boiled beans. Maize is very cheap feeding, and answers well for youngsters.

WORMS—Young colts should be carefully looked to, and when they show any falling off in condition more food should be given. Then if one looks bad amongst others that look well, the colt is either robbed of its food by the others or it has worms. The latter are easily got rid of by using Dalwood's worm powders, following up the same with a dose of linseed oil, and then for a few weeks giving half a drachm of sulphate of iron once a day.

Castration and Docking.

Castrate foals as soon as the development is sufficient to admit the performance of the operation. This never checks the growth as castration does later, and they grow just as high in the crest.

Colts should not be docked early. The army will not buy young horses for troopers (in peace time) that have been docked, neither will cavalry officers buy chargers with short tails, so it is better to leave the dock long until it is decided that the colt is not suited to either of the above requirements. Colts are bought for the army at 3½ years old.

Teaching Foals to Lead.

Small foals if handled from the first are easily taught to lead, and in the show ring it is much safer to lead the foal behind its mother, instead of letting him run loose and take the chance of getting kicked; and buyers will often buy a sucker if they see it broken to lead, when they would not otherwise do so.

MULE-BREEDING.

(Agricultural Gazette of New South Wales.)

When the Department of Agriculture last year procured from Queensland half a dozen mules, it was mainly with the object of demonstrating how much more suitable and economical such animals are for the working of orchards and farms with light cultivators and drills. It is claimed by agriculturists in the States that, by reason of its lighter weight, small feet, and ability to walk between the drills and around trees, the mule is far ahead of the horse, which for such work is unwieldy and too heavy, as a rule.

For work in the back country, where a horse suffers agonies from flies and heat, and at times from shortness of fodder and water, the mule, with its

tougher hide and greater powers of endurance, is certainly deserving of more consideration. In the coaching days of old a good many more mules were employed than can be found in the colony to-day, and it was not unusual to keep teams of them for the drier and more irksome stages. A good many were used, too, for packing in the mountainous mining districts. As soon as sufficient time has elapsed to enable a definite opinion to be formed, the results of the tests now being conducted at the Hawkesbury Agricultural College Farm will be published. The officer in charge of the mules has a lurking fear that before that time he will have been kicked beyond the horizon; but, to confess the truth, all this we hear about the kicking proclivities of the mule is a myth that cannot stand the strain of closer and more intimate acquaintance with the animal. A mule that is properly treated will stand the jangling of a bar against his heels in turning the implements as unconcernedly as a horse, and will behave well or badly according to the treatment he receives. Since the experiment at the College commenced, the tide of affairs in South Africa has created an enormous demand for mules, which it is not unreasonable to expect will in future be in steady demand for the transport and other requirements of the army authorities. For the information of anyone who contemplates breeding mules in this colony, the following excellent article by "Ghora Wallah," and for which the Department is indebted to the *Australasian*, might be read with interest and profit:—

How to Breed Good Mules.

The idea of mule-breeding is evidently catching on, for many people of late have had their attention drawn to the subject, and, as the industry once introduced will probably become an important one, a few hints on the methods of raising the various classes of mules will be useful to intending breeders. Although there has been some mule-breeding in Australia, I do not think it has ever been entered into with the same enterprising spirit that was shown in the initiation of other pastoral industries. I understand there are a few jacks in South Australia, principally used for breeding mules for hawkers' use, and which work satisfactorily. I have also been informed that in one district there are mules running wild in the scrub, someone who had formerly bred them having given up the enterprise: but up to the present time no mules appear in any statistics of the pastoral wealth of Australia, nor have I found any mentioned in any of the handbooks. Although the numbers of cattle, horses, sheep, swine, and even poultry are given in the returns, mules appear to be conspicuous by their absence.

The common mule (*Asinus bifornus* of Klein, and the grand mulet of Buffon) is the hybrid offspring of the jackass and the mare, and must not be confounded with the "hinny" (*Equus asinus*), which is produced by crossing the stallion horse or pony with the she ass. In breeding mules, as in breeding horses, the greatest care must be taken in the selection of the stud animals if the production of a really good mule of any class is to be ensured.

First, the stallion ass or jack destined to become the sire of mules is a type of animal quite distinct from the small donkey one sees carrying children about at English watering-places, or the moke which supplies the locomotive power for Coster Bill's barrow, for a good Poitou mule-getter stands from 14 to 15 hands high, while the large Spanish jack not infrequently reaches 16 hands and over, and the fact of there being at least some good specimens of the asinine tribe in England will be readily vouched for by any Australian who has seen the parade of sleek, well-groomed animals at the Crystal Palace Donkey Show.

There are several distinct breeds of asses (four at least are mentioned in the Bible), of which the Maltese jack was for many years a great favorite, and highly prized for breeding mules; but of late years he has become very scarce, in consequence of so many being exported to the West Indies and America for breeding from blood mares.

The pure Maltese ass has a perfectly black body, neck, and legs, with white or light grey under the belly and inside of the legs. His head should be light, with active ears, and eyes fringed with tan and white, as also his muzzle, which gives a nice expression to the animal's countenance. In height averaging about 13·2 hands, and in girth 5ft. 3in., the big Spanish jack seems to be an enlarged type of Maltese.

The Cyprus donkey has come into favor of late years, principally owing to the report of Sir Robert Biddulph, who, when Governor of Cyprus, spoke so favorably of the Cyprian jack as possessing every characteristic of the Maltese, that he was directed to supply a number of them to the Government of Bombay for mule-breeding. The black Syrian ass is another celebrated breed, as is also the white ass of Damascus, which is analogous to the white ass of the Israelites—"Speak, ye that ride on white asses, ye that sit in judgment," &c. (Judges v. 10)—but the Poitevin jack ass is a distinct variety, quite apart from the more symmetrical animal of the East, being both ugly and massive, with heavy barrel and short legs. The average dimensions of a good specimen of the Poitou jack, such as is usually used for breeding heavy draught mules from cart mares, are—Height, 14·1 hands: forearm, 19½in.; knee, 15in.; below knee, 8½in.; hock, 17½in.; below hock, 12in.; greatest girth, 77in.; girth behind shoulder, 66in.; length of head, 25in.; length of ear, 15in.; ears across from tip to tip, 32in. The Poitou breeders invariably select black or brown bay jacks, with whitish bellies, for sires. They have no use at all for greys, and prefer jacks with the tip of the nose covered with a slight down of a greyish-white color.

Secondly, with reference to the size and class of mare best adapted for breeding mules. This depends in a great measure, or I may almost say depends altogether upon the stamp of animal the breeder intends to produce, for invariably in the *equus cum asino* crosses the progeny will develop the head, ears, tail, mane, and extremities of the sire; but in the barrel, main limbs, and points will closely follow the dam. Thus the mule will be recognised by its large clumsy head, long erect ears, short mane, and tail with tufted extremity; while the hinny, or "Bardeau," as Buffon styles him, possesses the head, ears, mane, and hairy tail of the horse, his sire. So that the size and stamp of the dam must be considered as exercising the greatest possible influence with respect to that particular class of animal the breeder desires to produce.

Of the different classes, the Poitevin mule is the best suited for farm work. He is nearly as big and heavy as an ordinary cart horse; he is short legged, short jointed, big barrelled, with great knees and hocks, and plenty of bone below the knee, while his feet are comparatively large and less contracted than those of other mules, points which he inherits from the Poitou jack described above, his large body, girth, &c., being derived from his dam, a heavy draught mare. These mules vary from, say, 15 to 16½ hands in height. A good 16 hands 4 year old mule commands a ready sale, often fetching as much as £80, and the demand is so great that good animals can seldom be procured at the great annual fairs, for most of them have previously been either bought or bespoken on the farms.

The tall, finer limbed Spanish mule, which is black, or very dark in color, and sometimes stands over 17 hands high, is bred from the large Spanish jack, mated with carefully selected mare, which probably contains a considerable strain of the renowned Moorish barb; and the better class of Mexican and South American mule can claim a similar pedigree.

Some authorities say the most convenient size for mules is from 14 to 15½ hands, and advocate a cross between well selected mares, 14 to 14½ hands high, and the largest donkeys for draft or saddle, while they claim that mares between 13 and 14 hands produce the best size pack mule.

Mr. John Thompson, agent to the Duke of Beaufort, at Badminton, writes :—"The first Spanish jack was imported to Badminton during the Peninsular war, and the first mules by him were out of a large active cart mare. Three or four which she bred were upwards of 17½ hands high. Mule teams have been kept up ever since, chiefly home bred, but in consequence of the difficulty in procuring first-class jacks, imported animals have latterly been introduced. We have bred them from both cart and half-bred mares, and find that the stock from these are more powerful than the imported animals, being larger in the bone, and of greater substance. We have had jacks from Malta and Spain, but those from the latter country are generally superior. The mule foals are very hardy, there is no difficulty in rearing them, and when grown up they are less expensive to keep than horses. Ordinary carters drive the Badminton teams, composed of four mules each, driven double, and they will each haul a load of 50cwts., in addition to the wagon, at the rate of four miles an hour on a good road. They are especially useful in harvest time, as they travel so much quicker with light loads." Mr. Harvey Riley, formerly superintendent of the Government mule corral, Washington, U.S., in his book "The Mule," writing of the American mule, most favors the medium sized animals, of dark color, for general work, especially for draught purposes, but while doing so acknowledges that the Mexican mule of greater height standard is undoubtedly superior to anything bred in the States. He states that he has tried them both on similar conditions, and found that with the same amount of food the Mexican mule will not only keep up its condition, but do better work, and keep fresher when only halting three hours, than the American mule will with regular five-hour rests.

The first requisition for a mule-breeding establishment is, of course, the stud stallions, which, in the first instance, will undoubtedly be considered costly, for if a farm or heavy draught mule is required, a good Poitou jack cannot be procured for less than £200, if he is a proved mule-getter. They have even fetched as high as £400 in the district. A young improved animal of two years will vary from £80 to £120 in price. If a tall fast mule is to be bred, a large Spanish or Maltese jack will be found to be the best sire, and he may cost anything up to £1,000, but useful jacks of Syrian or Cyprian breed can probably be procured for much less. The studs of the "ateliers" or mule farms in Poitou usually consist of four to seven stallion asses, a stallion horse, and several she asses. A she ass for breeding purposes is worth from £25 to £40. The jack's fee runs from 16s. to 20s. for the service of each mare. The period of gestation in the she ass is twelve months.

Apart from the necessity of procuring good sires, the intending mule breeder must bear this very important fact in mind, "that it is an utter impossibility to raise good mules from bad mares, no matter how good or well bred the jack may be, for the bad mare is at once detected in the flabby long-legged mule."

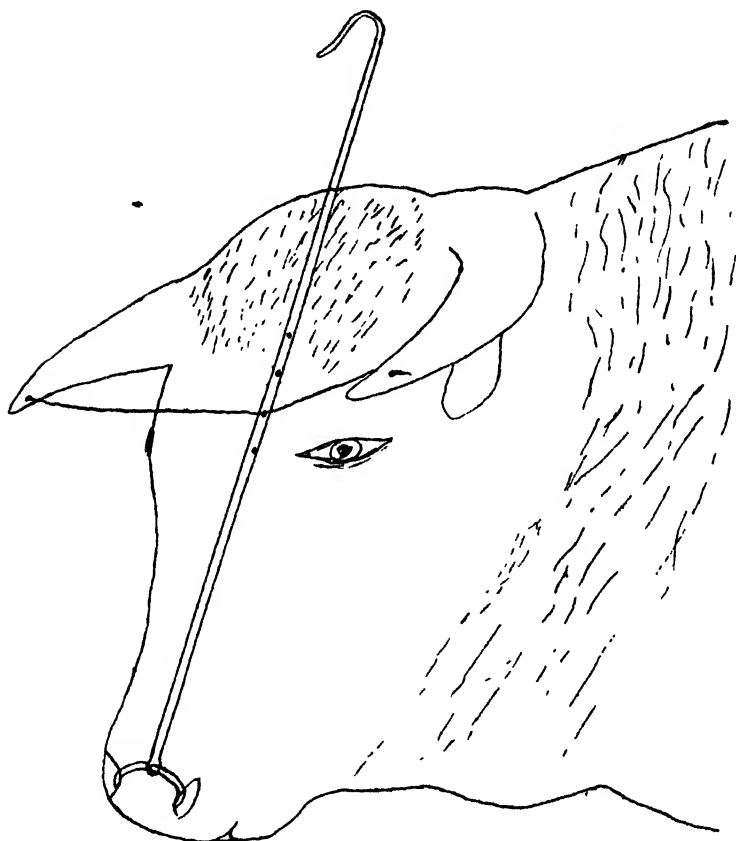
The mule foal should be halter-broken at a very early age—in fact some advocate putting short halter on at six months—for a great deal depends upon the way the mule colt is broken to the bridle, and how he is handled when young. Mexican mule drivers usually are on very good terms with their animals, and in the Southern States the good understanding between mules and their colored drivers is so proverbial that many people believe that there is some affinity between them. Mr. Riley states that it is no uncommon thing for Mexicans to ride their mules seventy miles in one night, and he has frequently known instances where mules which have been reported totally unfit for further service by their American drivers, have been ridden by Mexicans twenty to twenty-five miles without a stop.

It is universally admitted that the working life of a mule greatly exceeds

that of a horse. Instances, well authenticated, have been recorded where mules 70 years old were still working. The *Badminton Record* states they last longer than horses, the mule at 30 years being about equal to the horse at 20 years.

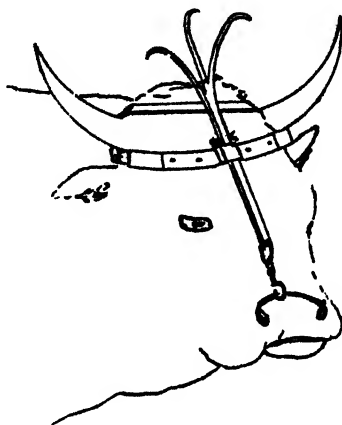
In France the mule colts are made to earn their living at a very early age. They are worked on the farms from the time they are 18 months old until they reach 3 to 4 years, when they are sold to dealers, who distribute them again in Spain, Italy, and other countries; but the work must be very light, otherwise the colts would be spoiled, as a mule is scarcely full grown at 5 years; and is not fully up to hard work until he is 6 or 7.

FENCE-BREAKING BULLS.



The above is a sketch of a method for preventing cattle breaking through fences, as submitted by Mr. A. J. Myren at the October, 1900, meeting of the Meningie Branch of the Agricultural Bureau of South Australia. By comparison with the following plan, invented by Mr. Smith, of Reynella (as mentioned in *Journal of Agriculture* for April, 1898, page 687), it will be seen that there is somewhat of a family likeness between the two designs.

The rod in Mr. Myren's plan would be about 33in. long, directly attached to the nose-ring, and supported by a wire fastened to one of the holes through the middle of the rod, and with both ends fixed through holes drilled through the points of the horns. This would support the bar and the nose-ring as well, so



that the bull (or other horned animal) may not be annoyed by the ring or the end of the rod. This plan is undoubtedly cheaper than that of Mr. Smith's; but the strap does away with the necessity to drill holes through the horns, and the whole thing is neater and more convenient.

TUBERCULOSIS IN PIGS.

Government Veterinary Surgeon Desmond made a discovery of tuberculosis in pigs at Nuriootpa. As there are some abnormal developments of this disease in this class of animal the matter is important. The pigs were owned by a butcher who, like many other butchers, is in the habit of feeding the offal from slaughtered cattle and sheep to his swine; and Mr. Desmond had seen a beef carcass on the premises with two old tuberculous nodules "about the size of an egg," but all other parts of the carcass were healthy. The offal, including the lungs, had been given to the pigs. One pig had been fed at 10 a.m., and appeared to be quite well, but at 5 p.m. it was dead. This sudden death made the butcher think it was poisoned, but the inspector reported:—"Mediastinal glands, caseating, showed well-marked appearance of tuberculosis. Lungs contained well-marked tubercular nodules as large as a pigeon's egg. Liver broken down, partly from decomposition, partly from being diseased. The stomach was healthy and free from any trace of poisoning. I secured the diseased tissues for bacteriological examination at the laboratory on my return."

The butcher informed him that he had purchased eleven pigs at Kapunda sale-yards four months before, and of these nine had died, six during the previous ten weeks. Accompanied by the butcher Mr. Desmond went to the slaughter-house and directed his attention to one of the two remaining pigs, which was evidently ill. The butcher had not observed similar conditions in the others that had died, but they champed their jaws, sat down on their hind quarters, always drinking, and appearing to have fits. This condition would last about a minute, and the animal would walk about again. The symptoms would last about ten hours before death. The pig which at the time of visit

appeared to be ill was then killed, and the following *post-mortem* observations were made:—Barrow pig, about six months old, in poor condition, sub-maxillary and retropharyngeal glands enlarged, pericardium adhered to the heart, and affected with tuberculosis; heart enlarged and affected with disease of the valves, which contained serous cysts. Tuberculosis of the heart is not often seen in animals or man. Lungs do not appear to be diseased. Well-marked tuberculosis of the peritoneum. All diseased tissues from pig were collected to be examined. This result determined the slaughter of the remaining pig, and *post mortem* afforded the following observations:—Black sow, did not appear when alive to be diseased, but when slaughtered exhibited tuberculosis of the abdominal organs. Upon bacteriological examination the following facts were ascertained:—The pig found dead exhibited Koch's bacillus of tuberculosis in all the lesions; cause of death, general tuberculosis. In the barrow pigs Koch's bacillus of tuberculosis was found in all diseased tissues, and the hepatic glands were enlarged. These will be further examined. The liver of the last-slaughtered sow pig was found to be extensively diseased with tuberculosis, and Koch's bacillus of tuberculosis was found in making bacteriological examination. Mr. Desmond had no hesitation in saying that the pigs contracted tuberculosis through being fed on raw offal from animals affected with tuberculosis. The fact that the three pigs examined had tuberculosis of the liver is conclusive that the disease was caused by ingestion, while the disease of the thoracic cavity was secondary to the disease in the abdominal cavity. The butcher was instructed that he was not to place any more pigs in the sty until he had cleaned out and burned the straw and also the thatched roof, and after the sty had been exposed to the air for a few days it was to be whitewashed.

FARM HINTS FOR NOVEMBER.

BY THE EDITOR.

Haymaking should be finished soon in all the earlier districts. If for sale, a nice green color is advantageous; but if wanted for own use the grower would do well to let the color turn a little bit yellow, so that there may be grain with the hay.

Because of the trouble connected with it too many farmers neglect to make silage. Where cows form portion of the live stock it will be found that pit ensilage is the best, and it is fairly certain that it is the best for all kinds of stock. If carefully and properly made the odor is not offensive; but it is nevertheless desirable that ensilage (whether sweet or sour) shall not be made near to the dwelling-house or to the dairy.

In order to maintain a full flow of milk from the cows they must be supplied with a good lot of succulent, easily-digested food, and this can be done only in one way or another—either grow maize, sorghum, and other well-known summer and autumn fodders, or else put down silage during this month. The advanced dairyman will not rely altogether on either kind of fodder, but will supplement it with bran, cake, and other food. But to compensate in part for the extra labor in making silage the farmers will find that an acre of crop converted into silage will go quite twice as far in feeding stock as it would if made into hay. Three tons of green stuff put into the pit will come out nearly 3 tons of silage, but the same stuff made into hay will hardly come out a ton of food, and it is not so readily digested.

Before reaping or stripping any cereal crop it would be worth the trouble to go into the field in search of specially good ears of grain. These should be gathered, thrashed, and the lightest of the grains winnowed out, whilst the rest should be sown in a nursery plot and re-selected next year. Thus, within a

short time, a good stock of really superior seed will have been secured. This system ought to be adopted in connection with every crop and product of the farm, garden, orchard, vineyard, as well as with the live stock, for deterioration and reversion to wild and uncultivated types is the inevitable result of neglect of this precaution.

He is a wise man who refrains from running after every new idea that turns up, but it is not always wise to neglect to test the truth or otherwise of assertions made or theories promulgated by persons who are entitled to our respect. It has been asserted again and again during the past fifty years that when wheat is harvested during its advanced dough stage the grain is heavier, brighter, and contains more gluten and flour and less bran and offal than when left till dead ripe, whilst the straw is nearly as good fodder as is the best wheaten hay, containing (amongst other nutritive and agreeable properties) a lot of sugar, gum, starch, oil, and aroma that is considerably lost when the crop is left till dead ripe. Surely, now, many of our farmers ought to practically test this matter for once and all.

There is another question that ought to be also practically settled; that is stripper *versus* binder. A good many farmers have decided after trial that there is good profit in binding a fair average crop and using the thrashing machine. Several others have also tried the plan and decided against it. Now both sides cannot be right, and if one side has really found profit in binding then the other side must have adopted a more costly system, entailing loss.

For seed wheat the crop ought to be reaped and thrashed or trodden out when the grain is neither too soft nor too flinty. There is no doubt that a large percentage of seed in many cases is injured in stripping the crop, and this fails to germinate—especially when pickled, as it ought to be. When the seed is perfectly sound it ought all to germinate, and therefore much less should be required to sow an acre of land. The uncertainty as to how much will germinate induces the farmer to sow much too thickly, and, if the seed should happen to be sound, there are too many plants to the square yard, with the result that there is a prolonged fight for air, light, and sustenance; and by the time all the weaker plants are killed the survivors are so advanced in life and so weak in constitution that they are unable to do more than produce two or three weak ears, instead of a dozen or more strong heads. This is well worthy of investigation.

An acre or two of rape near the homestead is a valuable asset where there are growing young pigs, or poultry, or any other animals about. If the soil is in good heart there will be no need to put on manure, but it will do no harm in any case. The richer the soil the better the crop of rape as a rule. Three to 5 lbs. of Dwarf Essex rape seed will suffice for an acre. It can be sown now on well-prepared soil—drilled $\frac{1}{2}$ in. deep is best—and then roll. When the plants have started fairly it may be worth while to put on a light harrow, or use the horse hoe between the rows. This is a splendid food for ewes and lambs.

Barley for feeding or for seed can be stripped if the beaters are wrapped with green hide and the spindles of the beaters are raised by placing green hide around them. The rind or skin of a piece of bacon serves well for raising the spindles.

Stacks should be covered at once and thatched as soon as possible. A shower of rain will do more damage to a stack than would cover the cost of thatching several times over. A space around the stack should be kept clear of grass, &c., lest a fire should spread to it, and of course there should be a fence to keep off stock. To prevent fowls getting on the thatch put in a few sticks along the eaves, projecting 18 in., and run two fine wires at 9 in. and 18 in. from the eaves. The hens always fly for the eaves first, and when they meet the wires they are thrown back in surprise every time.

Do not feed too many mangold or beet leaves to cows at first, else they will scour. After a few days a full ration can be given.

It is not too late to sow an acre or so of sorghum in drills if the crop can be frequently cultivated during its growth. Where irrigation can be applied maize can be sown.

When harvesting onions or potatoes they must not be hustled and hustled as though they were cobble-stones. Be rather careful in handling them, and very careful to get them away out of the sun if the weather is hot. Not only the keeping, but the flavor is considerably affected by rough usage and exposure to heat.

Peas and beans should be carried off in the haulms during early morning if the weather is dry and hot. The straw is much liked by horses and cows, and the whole plant may with advantage be fed to them and to pigs.

All machinery and implements should be maintained constantly in perfect order and repair. If anything wants cleaning or repairs have it done at once. Do not leave it until just before it is wanted for use.

VISIT TO WELLINGTON LODGE STATION.

BY THE GENERAL SECRETARY.

Having learned that a new and improved form of shearing machine had been introduced at the above station, and having also received an invitation to see it in practical operation, I visited Wellington Lodge during the last week in September. The head station is about thirteen miles southward of Tailem Bend, and there is an excellent cycling road for the whole distance. I must hasten to observe that I was taken there in a buggy by Mr. Allan McFarlane himself. At frequent intervals we passed along the Murray cliffs, and it was pitiful to note that the costly embankment erected by Mr. Jervois (nephew of our respected ex-Governor) has been breached by the floods in several places, and the richly grassed reclaimed lands have reverted to the original swampy condition. To effectually protect such land requires not only the expenditure of an enormous sum of money in embankment and in planting of willows and other trees, but there must also be a deal of engineering skill in and during the erection, and a close and constant observation and strengthening of all weak places. There are many thousands of acres of similar swampy lands along the tortuous course of the Murray; but to effectually reclaim any one of these would require the treasury of a Croesus and the luck of Fortunatus, combined with the patience of Job and the faith of all the early martyrs that no difficulties shall afterwards arise to obstruct them in the enjoyment of the fruits of their labors. When, however, this embankment is effectually constructed, and the drainage properly provided for, the value of such reclaimed land is greater than its cost. Such work does not come within the sphere of the ordinary working man, and it remains either to be taken up by the State, as a national undertaking, or by capitalists. In the latter case it is imperative that all their rights and privileges in respect to the reclaimed land shall be most strictly guarded in the future as well as at present.

The homestead at Wellington Lodge station is extensively and substantially built of limestone. Everywhere about are evidences of the enterprising spirit of the owner in the shape of implements and machinery of all kinds, not pastoral alone, but agricultural and horticultural—steam-engines, oil-engines, wind-engines, reapers, spray pumps, ploughs, cultivators, in superabundance. Every advance in these implements, &c., seems to have found a place here, and numerous sheds apparently do not afford sufficient shelter for them, for in one place there is a long stretch enclosed with old wagons, drays, strippers,

rolls of wire, ploughs, oil-drums, and a hundred other articles which would gladden the heart of "Johnny Allsorts" to possess. This apparent "waste" is good for trade, as the purchase of newer and more effective implements gives employment to the honest working man, and an opportunity to the capitalist to circulate his money.

The estate consists of 43,000 acres of purchased land, and 6,500 acres of scrub leases. Much, if not the greater portion, of the freehold land was once occupied by farmers, who found it unsuitable for their occupation. Over large areas there is a depth of soil of 2in. to 6in. upon limestone crust, with brine at short depths below. Consequently stock had to travel long distances to the lake or river for water. Mr. McFarlane has large cemented reservoirs, supplied by 3in. pipes from a water-tower erected at the homestead. The tower is 75ft. high, with a very large tank and a powerful aeromotor at top, as well as a costly oil-engine at foot to provide against accidents. The pipes from that tank extend a distance of five and three-quarter miles to a stone and cement tank with a capacity of 100,000galls., connected automatically with a series of cement troughs for watering sheep. The floors adjacent to these troughs are also cemented. The pipes are mostly gas tubes, screwed together with a sliding joint at every 200yds. Some cast-iron pipes connected by flanges with packing between are always giving trouble through expansion and contraction, whereby the packing becomes loose, and water consequently escapes. There is another large wooden tank holding 25,000galls. with three miles of 2½in. gas pipes, filled from the tank in the garden, quite independent of the tower tank.

There are 150 miles of very substantial sheep-proof fencing on the estate, of which thirty miles are wire-netted 5ft. to 5ft. 6in. high, all leaning outwards to prevent ingress of rabbits and dogs—probably also of foxes, which are becoming rather numerous in the adjacent scrub.

Drifting sand has been a source of very considerable anxiety in the whole district, owing to destruction of the shrubs, trees, and grass by fire and by live stock. Upon advice given by myself some years ago to Mr. Clough, of the railway service, lupins, evening primrose, and marram grass were sown and planted, and at present there are considerable areas covered with lupins and primrose; but it remained for Mr. McFarlane to show what marram grass can do in the way of stopping sand drifts. The hills were enclosed with fences, and he has now over 300 acres covered with this splendid grass. A deal of it stands over 3ft. high, and it is as thick and close as a wheat field—in fact, very much thicker and closer. Every year the area is extended, but up till the present no stock have been allowed to graze upon the grass, as it is considered that the risk of renewed sand drift is of greater importance than the value of any fodder that can be grown to prevent the drift, and also to protect the numerous young trees that are springing up naturally.

Every old colonist knows that Mr. McFarlane is a champion rifleman, but they are not aware that he possesses an arsenal comprising pretty well every new form of rifle, pistol, and gun that has been brought out during the past thirty years, together with the appurtenances connected therewith, and all varieties of explosives and bullets or other ammunition used. He showed a plate of steel, half an inch thick, through which he had fired a bullet from a '236 "Lee" straight-pull rifle, as used in the American navy—with unpleasant results to himself from the splinters flying back. This armory is a most interesting place to anyone who knows anything about guns and rifles.

The shearing-shed is very commodious, and quite as substantially built as the numerous other stone erections about the property. The shearing is effected by means of Ford's cold-air shearing machine, the only one, I believe, in South Australia or Victoria; but they are coming into use in New South Wales. It does its work exceedingly well, shears clean and close, and possesses many advantages

over most other forms of shearing machines. There is no gearing to cause intense friction, heat, and consequent wearing. This heating, in some other forms of machine shears, is intensely cruel to the sheep, scorching their skin almost to the point of cooking, and even making the shear too hot for the man to hold, and is said to retard the future growth of the wool. The cold-air machine is said to make 2,000 cuts per minute, but as the air which drives it has been compressed and reduced to almost freezing point in escaping partly over the cutters and partly through the handle, the machine is quite cool and comfortable both for the sheep and the men who shear them. This rapid movement of the cutters prevents the tearing-out of the wool that is characteristic of some of the geared machines; and the fact that the tubing conveying the compressed air to the machine is not subject to the rapidly revolving gearing used in other machines makes it far more pliable and easily worked over all parts of the sheep, and the vibration is of course next to nothing. The air escaping from the machine contributes to the coolness of the shed, the sheep, and the shearers, besides helping to purify the shed. The air is condensed by aid of a 20-h.p. Hornsby-Ackroyd oil-engine usually; but in absence of suitable oil, a 10-h.p. Hornsby portable engine was in use, driving a compressor on 20 in. stroke 140 revolutions per minute. Each compressor is 10 in. diameter, and the pressure on the mains conveying air to the machines through rubber tubes is about 20 lbs. to 25 lbs. per square inch. Each rubber tube has a small tap by which the pressure on the shearing combs can be regulated, and the machine stopped or started. The number of sheep being shorn this season was less than usual, numbering only 36,000 to 37,000, and the clip is not heavier, if as heavy, than in former seasons, but very clean and free from grass seeds.

Another special feature in this estate is the splendid herd of Durham cattle, all dehorned except the bulls. In character all through they very closely resemble the Shorthorns of Mr. J. H. Angas's herds, and would closely push them for first place in a competitive exhibition. There were 300 in all, and these were simply "rolling fat." A few were sent to market a week to two back, and brought almost "record" prices. The horns are removed by aid of a patent "dehorner," which resembles an enormous pair of shears. There are a good many horses of a good stamp for vehicular and saddle purposes, and a few of them would possibly take good positions on a racetrack.

The sheep are all Merinos, and are well bred, as would naturally be expected on such a well-conducted station.

In order to reclaim a piece of flooded land along the margin of the Murray, Mr. McFarlane has had an embankment constructed at a cost of more than ten thousand pounds. The bank is just under four miles in length, and is 26 ft. wide at base, 6 ft. high, and 6 ft. wide at top. The embankment required 162,304 cubic yards of soil and rock, because in some places the whole lot sank bodily into the boggy bed within a few hours after erection. To prevent this as far as possible many hundreds of loads of timber—chiefly "native pine" (*Callitris robusta*) were carried in and laid as a bed for the bank. Of course a tramline was used for trucking the spoil to its destination, and as this soil was very poor sandy marl, limestone, &c., it was necessary to use a good lot of bonedust on its surface to enable the necessary binding plants to grow. Between the embankment and the river there is a wide strip planted with many hundreds of thousands of willows at 9 in. apart, and some poplars, and upon the slopes and top of the bank are lucern, clovers, medics, grasses, and herbage of many different kinds. The area reclaimed is over 700 acres of rich, deep, peaty swamp and fat clay soils, capable when mellowed by exposure of growing no end of fodder plants or anything else. At present it is covered with a rank growth of all kinds of reeds, rushes, sedges, and similar coarse

vegetation, which will be permitted to mature and decay, producing a rich, fertile humus. There is no intention of burning this growth, as such would undoubtedly be a most wasteful act; but it is unfortunately a very common practice with people who think life is too short to wait for nature's work, and who consider that a shilling to-day is worth more than a pound next week. The embankment above mentioned was commenced on January 17, 1893, and finished February 28, 1896. From the cliff at the north-east end 68,506 cubic yards of material were taken. About the middle, at half a mile east of the bank, 63,957 yards were taken from the cliff; and at the south end 29,841 yards went to finish this extensive work—making a total of 162,304 cubic yards. Between the embankment and the river more than 50,000 willows have been planted; some of them are golden willows and other osiers, but the great majority are the common weeping willows (*Salix babylonica*), which are the best for this work, and have done better than any of the others.

There are about ten miles of frontage to the river and lake on this estate, and most of this has been planted with a wide fringe of poplars and willows—mostly willows—to prevent encroachment on the shores and banks. Additionally to the usefulness of this extensive work, the whole appearance of the river and lake margin is beautified by the lovely green of the drooping branches; and the shade and dense growth in the water itself affords bountiful shelter for young fish, which otherwise would be destroyed by the cormorants and many other birds which prey upon them wholesale.

WINE AND CELLAR NOTES.

BY ARTHUR J. PERKINS, GOVERNMENT VITICULTURIST.

For the winemaker the event of the past month has been the Royal Agricultural and Horticultural Society's wine show. As at the public tasting held on the 17th I had an opportunity of sampling the wines exhibited, I may be allowed to offer a few general remarks on the subject. It would not be politic to criticise the awards of the judge, nor do I think it at all advisable. The society under whose auspices the show is held appoints a judge, and exhibitors cannot but abide by his decisions. Let us bear in mind that no judge alive could give satisfaction to all alike. Failure to secure prizes should only stimulate us to further efforts in the future.

On November, 1894, I read a paper before the South Australian Vinegrowers' Association relating to the classification of show wines. In it I advocated the adoption of some slight alterations in the system hitherto in vogue—the careful definition of the groups into which the wines were divided, and the rejection of any system having for its object the introduction of the names of well-known European wines. Six years have now elapsed since these views were first expressed. On a present reviewal of the situation I can see no reason for altering them, whereas I can see matter for regret that they have not hitherto been given full effect. Anybody going through this year's show wines must recognise that in one and the same class are huddled together a great variety of types of wine, and in one class, at all events, not a single exhibit should have been legitimately included within it. It is well enough to have a fairly satisfactory system of classification, but unless the limits of each class are strictly defined the exhibits cannot but be more or less chaotically jumbled together. The judge should be apprised of the limits, and have full power to place in its proper class every wine that had not been properly entered. In my

paper previously referred to I sketched out some such scheme. I do not claim for it perfection ; it might possibly be modified, but I maintain that the lines on which it has been drawn up, if adhered to, would materially help to solve the present difficulty.

At the luncheon given to the judge, Mr. Max Cohn, by R. A. & H. Society the latter suggested that our show list should include wines as they are set on the market under those names that we have borrowed from other countries. To the latter part of his suggestion I must distinctly take exception. We have but to bear in mind what happened to Californian wines at the late Paris Exhibition. In California, as under the Southern Cross, the practice has apparently prevailed of adopting for local wares the names of well-known European wines : the judges, rightly to my mind, unanimously threw out these wines masquerading under borrowed plumes. If the R. A. & H. Society were to set the seal of its approbation on this unfortunate practice by including foreign names in its show list it would tend to become even more general than it is at the present moment. As for the first part of Mr. Cohn's suggestion, I see no reason for it. We have classes for young wines and export wines ; presumably the remaining classes should include wines in the state in which they are placed before the consumer. In this connection it may be noted that in many of these classes the pride of place was given to many excellent young wines to the exclusion of older ones better adapted for the present, at all events for table purposes. This is hardly as it should be. Given that we have classes for young wines and heavy blending wines, the prizes in the other classes should surely go to those that have already reached perfect maturity and not to those that may possibly surpass them in the future. In connection with these wines I do not, of course, attach any special virtue to mere age ; I refer merely to some thoroughly well matured wines of high character that were left severely alone.

Some of the classes call for special notice. Classes V. and XIII. (full-bodied dry whites, 500galls. and 100galls. respectively) included to my mind no exhibit that could legitimately claim to come within its limits. In order to get a better idea of this fact it is sufficient to compare the wines exhibited in this class with the full-bodied dry reds (classes IX. and XVII.). The former are all highly-fortified wines belonging more correctly to a sub-division of the fruity class, whereas the latter are genuine full-bodied dry wines considerably weaker in spirit than the former. To get over this ever-recurring difficulty I suggested in 1894 that fortified or liquorous wines be included in one class with sub-divisions into (1) dry, (2) fruity, and (3) sweet. It might be adopted with advantage for the 1901 show.

In classes IV. and XII. (dry white, of a light character) many of the exhibits were too strong, belonging more correctly to the full-bodied dry classes ; nor did the lighter wines secure prizes. The red wines were, I believe, on the whole, better than the whites, but do not otherwise call for special comment. The sweet and fruity were, as usual, good, though in some instances the taste of poor spirit was rather pronounced.

Every exhibitor may show three exhibits in each class. This I think is a mistake, giving, as it does, undue advantage to those who are able to show several samples. Surely every maker is able to pick out the best of his wines.

As much as possible the lottery element should be discarded from a show. Personally I am of opinion that not more than one exhibit should be allowed in one class.

On the whole there is no doubt that the wines were very fair, far in advance, particularly in the dry wines, of exhibits made four or five years back. It is pleasing to note the high percentage of prizes secured by comparatively new growers. There is no doubt that much of the improvement in our general methods and in the value of our wines is due to the stimulating effect of their untiring perseverance, and their natural tendency to question the value of older practices that had not always resulted in the manufacture of good wines.

And, finally, just a suggestion as to the selection of judges. It must be recognised that the task of examining all the exhibits within a limited space of time is perhaps more than can be expected from the energies of a single judge. Why not have separate judges for the different classes? Why not, for instance, ask the representatives of the London buying firms to judge the export wines? Why not have separate judges for the sweet and dry classes? And for the young wines should not a winemaker and not a wine merchant make the more efficient judge?

..

..

..

During the course of the present month all 1900 wines should be racked again, and generally, wherever possible, consigned to the cooler portions of the cellar. Older wines there will not be any necessity to rack, unless any special reason for doing so may accidentally arise.

THE VINEYARD.

SEASONABLE NOTES.

BY ARTHUR J PERKINS, GOVERNMENT VITICULTURIST.

In November the flower buds open out, and it is to be hoped that we may experience weather favorable to the setting of fruit. Boisterous winds (cold or hot), rain, and cold weather are so many factors against good setting; calm, warm weather, slightly overcast skies, on the other hand, usually ensure a high proportion of fruit. Cryptogamic diseases, accidents of all sorts, are apt to hinder the setting, and consequently general sulphuring should be resorted to at the first appearance of disease. Sulphur and its fumes do not affect the process of fertilisation; in fact, they appear to stimulate it. The flowers may, therefore, be heavily coated with sulphur without injury to the latter. Where growth is rather rank, and there is danger of the plants running to excess of wood, there is advantage in pinching off the growing tips of the fruit-bearing shoots just as the flowers open. This operation, very distinct from indiscriminate topping, gives a momentary check to vegetation, and enables the fruit to set to better advantage.

..

..

..

Late showers in October have given rise to the formation of a crust over vineyard soils. The latter should be rapidly broken up with the scarifiers, preferably before the bursting of the flower buds. Scarifying should be resorted to throughout the summer months as often as necessary, but not more;

if the soil shows a tendency to cake it should be scarified, similarly if it carries a growth of young weeds; otherwise there is no advantage in exposing the moisture under surface to drying atmospheric action. Never scarify sandy soils dry.

..

..

..

Young vines should be carefully hand hoed, loosening the soil that adheres to them. Mixtures of bran and Paris green should be carefully placed around them as soon as the *Agrotis* caterpillars or cut worms make their appearance. There is reason to believe that they will be unusually plentiful this season. Grafts should be visited and suckers and rootlets from scions carefully suppressed.

..

..

..

October has been a very unfavorable month at Roseworthy for vines. It has been comparatively rainless, and marked by two hot spells and rather frequent hot N.W. and N.E. winds. Young vines have suffered considerably, whereas a heavy shower would almost have permanently secured their successful rooting. Cuttings are again in doubtful stage; in fact, I am afraid that without October rains the latter are doomed to failure in this district.

I append meteorological data for the month, up to the 27th:—

	Mean for Month	Highest Reading.	Lowest Reading.
	F.	F.	F.
Maximum solar radiation	134.5	151	115.5
Exposed minimum on soil	43.5	55	30
Exposed minimum 18in. from ground	44.0	56	31
Maximum air temperature	77.6	99	64
Minimum air temperature	46.5	55.5	34.5

There was a slight frost on the 13th, but it did comparatively little damage affecting alone a few young vines in a low flat. The mean amount of effective heat per diem for the month, so far as plant growth is concerned, amounts to 90.5° F., as against 83.7° F. for the preceding month.

THE VEGETABLE GARDEN.

NOTES ON SAVING SEEDS.

BY GEO. QUINN, HORTICULTURAL INSTRUCTOR.

The approach of summer will cause all kinds of spring season crops to run to seed rapidly; consequently a few notes upon saving seeds from such vegetables may be of value to amateur gardeners.

There are two important principles underlying this work, viz., care in preserving the high quality of the strain by always selecting the best specimens; and, secondly, by avoiding contamination through the cross fertilisation of the flowers from some allied variety. No cultivated plants run back to their original types more quickly than kitchen vegetables; consequently "eternal vigilance" is necessary to ensure seeds capable of producing crops of the highest quality. Artificial selection upon definite lines has developed the present standard of excellence, and its constant application alone can avoid retrogression.

Broad Beans.—These are valued almost exclusively for their seeds, although some people use the young tops after boiling in water twice. Plants having a thrifty, rapid growing habit, and producing liberal and early crops of well-filled

Pods, are to be desired. It is a good plan to go through the crop early in the season, before any pods are gathered for kitchen use, and mark all plants approaching these requirements. The pods are ready to gather when the foliage and stems blacken. In selecting from the marked plants do not take them indiscriminately, but discard or, better still, pick while green and utilise all of those only half-filled with beans, or those in which the seeds are separated from each other by wide open spaces. The pods should be spread out in a dry airy shed, and allowed to ripen naturally. When this has taken place the haulms may be thrashed over and the seeds collected. Though beans sometimes will germinate after many years, they are uncertain, and it is not wise to hold seeds more than three or four years.

Cabbage.—The most densely-folded head, possessing good flavor and rapidly maturing properties, but not readily running to flower, would sum up the desirable qualities of a good cabbage. If any of his plants possess these characteristics the grower should mark off a few and reserve them for seeds. Some growers lift the plants, remove the outer leaves, and plant them again deeply with the base of the head resting on the soil. This is not an imperative practice, but when known to the amateur he may utilise it to put specimens reserved for seeding out of the way of succeeding crops. Sometimes, owing to the compactness of the folded heart leaves, the flower-stalk cannot ascend, and the head rots. This can be averted by gently opening the folded leaves and fracturing a few of the midribs of the most stubborn ones, taking care not to injure the central stalk enclosed beneath. No member of the family, such as turnip, cauliflower, &c., should be permitted to bloom uncovered in the garden at the time when the reserved plants are in flower. To keep away pollen-carrying cross fertilising insects a fine gauze cover should be tied over the buds before the blooms open. This should be left on until the seeds are gathered (loosening it from time to time as the pods expand). This keeps away seed-feeding birds to a very great extent. The seed pods should be examined and harvested as they gradually ripen. They should be thrashed as soon as thoroughly dried, and stored away secure from insect life.

Cauliflower.—A rapidly-grown, densely-folded, shapely head of creamy white color, possessing a delicate—not hot—flavor, may be said to sum up the good qualities of a cauliflower. Any specimen answering to this would, under the same treatment as suggested for the cabbage, yield, in the majority of instances, good seeds.

Carrot.—A good carrot is recognised by the clean, smooth, well-shaped root, possessing a crisp sweet flavor and good color, be it yellow or reddish according to the variety. No branching root should be tolerated. To be sure of the character of the roots selected, some of the early crop should be lifted carefully, portion of the top removed, and the chosen roots replanted. If the plants will not be in the way of further cropping for the season, the roots can be examined by removing the soil around them to their full depth, and thus determine the most suitable for seeding. As the seeds begin to turn brown cut away each umbel as it ripens to prevent waste of seed by shaking. Place in bags and hang in a dry place. Do not keep carrot seeds more than two years, or germination will be irregular.

Celery.—This is valued for the length and breadth of the leaf stalk and the delicate flavor it contains. These stalks should be a solid mass of cellular tissue, in which fibres are almost totally absent. Plants answering these requirements should be reserved, and when the flower stems begin to branch they should be staked to prevent shaking out the seeds as they ripen. When ripe collect and store, thrashing out the seeds when convenient. If the ground is required for other crops the plants may be lifted, the outside leaves removed, and the plants reset in a shady place, giving supplies of water as required, but this can only be safely performed in winter on the plains.

Kohlrabi or *Knol-kohl*.—This is valued for the turnip-like stem. In saving seeds for the production of plants for kitchen use, select quickly-grown specimens possessing a delicate flavor and measuring about 4 in. in diameter. The general treatment suggested for the cabbage applies to this plant.

Leek.—These are esteemed for the size and flavor of the stems. They do not readily run to seed, so it may be necessary to keep them over till the next season, as is done with the other members of the onion family.

Lettuce.—The ordinary cabbage lettuce should form a compact solid heart, in which the leaves fold over very closely and blanch the inner portion. The crisp best flavored heads are those grown rapidly in cool weather. In selecting plants for seed those grown early in winter should be chosen, and only such of these which stand the longest time without sending up flower stems. Secure the seed stems to stakes, and collect the seeds from time to time as they ripen, or they will be shaken out by the wind. Hang to dry in airy shed before cleaning up.

Onion.—When the bulbs are harvested select those which are smooth in the skin, firm and heavy, and mild in flavor, on which no flower stems have formed. The color and size will be determined by the variety grown. If a large sort, then select the largest bulbs conforming to the above; if small or medium, select accordingly. Keep the bulbs stored in a cool airy building in subdued light. With the opening of the season, say in March on the plains, plant them out in good soil, covering the bulbs about an inch. When the flower heads form it may be necessary to cover them from insects or birds, or stake them against wind, just according to the local surroundings. When the seed vessels are turning brown the heads should be cut, or the seeds will be shaken out. Spread on bags or paper in a dry airy shed until dry enough to thrash. Never keep onion seeds over the second year, or their fertility will be lost.

Pea.—In selecting pods for seed purposes care should be taken in choosing them if a productive strain is to be maintained. Only those of a full size—this is determined according to the variety—in which the whole of the seeds are evenly and completely developed, should be gathered. If, as is frequently the case, only the leavings after the season's picking is over are collected for seed purposes, the strain is bound to deteriorate. Small or half-filled pods tend to the production of plants perpetuating these defects in their fruits. The pods are ready to gather when they turn light brown, and lose their crispness to the touch. They should be spread to dry on cloths or papers in open ventilated sheds or outdoors if secure from animals. When the pods burst naturally and curl the seeds should be thrashed and winnowed.

Parsnip.—The roots reserved for seeding should be large, white, tapering, crisp, and quickly grown. Sub-divided or forked rough surfaced specimens must be avoided. General treatment same as applied to the carrot. Seeds more than two years old are usually valueless.

Parsley.—Plants producing thoroughly curled leaves should be saved and allowed to run to seed. This usually takes place during the second season. Collect when the tops turn brown, dry in shed, and thrash the seeds when convenient.

Radish.—The long tapering and the short turnip varieties should not be in bloom at the same time. Choose plants which have grown quickly, forming crisp well-shaped roots of a mild flavor. Plants which refrain longest from sending up flower stalks are the best. The flower stalks are sometimes bent down, or the roots are transplanted, when first selected for seeds, with a view to checking vitality and allowing the pods to form. The plants should be tied to stakes when flower stems develop, as they are readily blown down and broken by the wind. When the pods turn brown and dry they should be gathered and stored in a cool dry place to be thrashed as an opportunity occurs.

Turnip.—Large, quickly-grown roots, crisp and mild in flavor, should be chosen. Great care must be taken to avoid cross fertilisation from other varieties or inferior plants of the same family. All of the latter should be destroyed before flowering, and the reserved plants covered with gauze before their flowers expand. The seeding tops should be cut when turned dry looking, and placed to mature in airy place. Turnip seed should not be depended upon after it is over three years old.

NOTES ON VEGETABLE-GROWING FOR NOVEMBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The season continues favorable for vegetable crops. On the plains the work in the kitchen garden this month will be almost identical with that set out in our notes last month. Successional sowings of dwarf and runner beans will be made in the usual manner. Further settings out of tomato, chili, and egg fruits will be performed. All kinds of melons may be sown early in the month, but the plants will require stimulating with water and manure to enable them to develop quickly.

The late crops of peas will require abundance of water or the pods will not fill. Early onions will be harvested, and later lots should receive plenty of water to stimulate them to grow before the weather becomes too hot. The soil should be stirred between the rows and all weeds destroyed.

Dig up potatoes as the tops yellow off; otherwise the caterpillars of the potato moth will most certainly attack them should the weather turn dry.

Tomatoes should not be forced with too much water or manure until a few fruits are set—not when a few flowers appear. A dressing of superphosphate, say, 2ozs. to the square yard, gently forked into the surface and then watered, will stimulate the plants to grow moderately and fruit abundantly. The plants should not be allowed to rest upon the soil. In small gardens wire netting 3ft. wide, stretched horizontally on stakes projecting 1ft. out of the ground, makes a good support for the branches.

Cucumber plants which have reached the running stage should receive attention, to avert damage to the runners from winds. They could be pegged down and the points pinched out to induce branching. Apply plenty of water to all growing crops of melons, marrows, &c.

Asparagus plants should be encouraged to make all the growth possible now. To attain this end apply a dressing of from 1lb. to 2lbs. of nitrate of soda to each rod of ground prior to giving it a good soaking with water. This may be repeated several times during the season of growth.

The soil should be stirred with fork or hoe between all growing crops, and where at all practicable fine broken stable manure should be spread thinly over the surface as a mulch. When, after watering, this is gradually mixed with the surface layer by the hoeing or forking it improves the physical character of all soils which tend to cake upon the surface.

Do not let any useless specimens of vegetables run to seed, but rather chop them down, and feed them to cattle or throw them into the compost pit. In a separate article on "Saving Seeds" I have dealt with the necessity for doing this.

In sheltered spots the usual sowings of cress, radishes, and lettuces for salad purposes may be made, but only by exercising the greatest care can these be produced during the summer upon the plains.

PICKLING CUCUMBERS.

Commence to gather the cucumbers just as soon as they are a good average size. After once commencing to gather them, all that are of a suitable size must be gathered regularly, as the vines will stop bearing if the cucumbers are allowed to ripen. Every other day (while the dew is still on them—in the morning is the best time) take a sharp knife and cut them off the vines about $\frac{1}{2}$ in. beyond the end of the cucumber. If the little stems are not left on the pickles will spoil. Wash them well, being careful not to bruise or scratch any of them. Any that are not perfectly sound must not be used. Never use a barrel or crock that has had anything greasy in it, as grease invariably spoils pickles. After draining a few minutes spread a good thick layer of dairy salt on the bottom of the barrel, and begin to lay the cucumbers on the salt, putting them in side by side until you have a layer of cucumbers; then sprinkle a layer of salt over the row, then another layer of cucumbers, and so on, always finishing with a layer of salt. The cucumbers may be put in whenever gathered, whether there is a full layer or not. After a time brine will begin to make, and then they must be weighted down, first putting a cloth on the cucumbers. Keep filling in the above manner until you have all you wish, or until the barrel is full. The pickles must be kept under the brine all the time. Put a cloth over the top of the barrel, and then lay the lid or top of the barrel on the cloth to keep out dirt and mice. The pickles will be ready to use in about six weeks. When any are wanted for use take out about enough to last for a month and put them in clear cold water. Keep changing the water every day until the salt is out of the pickles, then put them in a crock or glass jar and cover them with vinegar. If the vinegar is very strong it should be weakened a little, as too strong vinegar will eat pickles and make them soft. Scum will sometimes form on top of the pickles, but it can be skimmed off as the pickles are taken out, and does no harm. If they are well weighted the scum will form on the cloth directly over the pickles, and this cloth may then be taken out, the scum rinsed off then put back again.

Pickles laid down in this manner will keep an indefinite length of time, and anyone once trying them will always make their own pickles, as they cannot be surpassed by the costliest ones in the market.—*Pacific Rural Press.*

ORCHARD NOTES FOR NOVEMBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

On the whole the spring is proving favorable to fruit crops. In most localities the trees are showing a wealth of foliage not equalled for years past. We cannot expect the results of the fine winter just gone to be seen in large crops of fruit during this season, but with ordinary good fortune we may look forward hopefully to good results in the near future.

Greater care is now being taken in summer cultivation, and the why and wherefore is becoming more generally understood. As with all other truisms, one seems to almost weary of repeating "the old, old story" of capillary action, but as new cultivators are each day coming into the arena, and knowledge is conferred neither by birth nor the choice of occupation, one needs must repeat. The object of summer cultivation or tillage is to break up the surface, so that it forms a complete mulch of thoroughly pulverised earth. When through rain, irrigation, or even prolonged slow evaporation, the disintegrated mass again begins to cohere its value as a mulch lessens and rapidly ceases. It must therefore be renewed from time to time as the return to an

encrusted condition is noted. This should be done by means of an implement that stirs and pulverises the soil without ridging or turning it over. Ridges offer obstruction to winds and sunshine, thus becoming dry and warm more rapidly than flat ground. This is taken advantage of by gardeners to raise winter crops. In some orchards which were ploughed early in the winter the soil turned up in lumps, and the lumps baked before they could be broken. Lumps made thus in some soils will not pulverise without the aid of a roller, and this should be used as soon as possible after a soaking rain. Immediately after the roller the scarifier should follow to reduce the surface to a fine tilth again.

The thinning of fruit will require attention at once. Peaches and apricots are improved most by this work, though it follows that other kinds would equally benefit were the operation applied judiciously. Apples and pears are usually thinned by winds, codlin moth, or other pests.

In thinning apricots consider the general health of each spur and tree, and carefully observe the results from time to time, as in each locality variations in the capabilities of these trees to carry crops will be noted. As a general rule to guide the beginner it is safe to assert that the further out upon the lateral spur the fruits are carried so much less must be the capacity of that lateral to carry many fruits.

At this period a very fair conception of the probable extension of each spur can be formed. This also should assist in the operation. In thinning peaches the position of each individual fruit must be considered. A position favoring early or late ripening, as may be required, and the full development of shape and color are of greater importance than the future extension of the bearing shoots. Peaches bear upon wood which is removed during the following winter; consequently the future welfare of the bearing shoots does not interest the operator. Those well exposed to light will color and ripen first.

Green or summer pruning, in the form of disbudding or reducing barren or semi-barren shoots, will be in full swing. All newly-planted young trees should be carefully examined and their rampant shoots pinched, and clustered shoots removed. In the first instance the tip of the growing point is removed to temporarily check the extension of the strong shoots. This sets back the sap and gives the lower and less favorably situated shoots an opportunity to acquire an equilibrium. Shoots not required for furnishing main arms often spring from the main stem of the young tree. These may be retained to shade the stem if the growing points are constantly pinched out of them. This restricts their development to a stub carrying a bunch of leaves.

Disbudding mainly consists in rubbing off shoots not required to form laterals or leading shoots. Twin shoots often start simultaneously from base buds. One of these should be rubbed out. Distribute the laterals so that good light can reach every leaf and bud upon the tree. On established apricot and peach trees which have reached a fair size more leading shoots than required will arise. Rub out those tending to crowding, and more particularly such as threaten to fill up and over-shadow the centre of the tree.

The shortening-in of the barren or semi-barren shoot applies more particularly to the peach and nectarine. On these trees many shoots left to carry fruit have either failed partially or wholly to fulfil expectations. In pruning all such, cut back to the young shoot immediately adjoining or above the fruit, where such is carried. If no fruits are set, cut back the barren shoot to the lowest pair of young shoots emerging from its base. The reasons for this work are obvious. If not done now the tree will extend unnecessarily and become full of barren bare shoots, whereas by following these precautions the annual fruiting wood may be retained almost directly upon the main shoots.

When the fruits are all harvested from loquat trees the old flower stems

should be cut clean away and any surplus shoots thinned out. Always remember that the spikes are borne upon the terminal points of the shoots; therefore give each shoot room to mature in full light. In dry localities it may be necessary to apply water to young trees. As soon as the soil is workable break up and pulverise the surface, and pay special attention to breaking up furrows and rings, to prevent hardpan forming. The best method to test the moisture in the soil is to dig a hole near the tree. Should the soil adhere in a moulded lump when a handful is squeezed it will probably not need water for a while.

If grown on the premises, and a ball of earth can be secured upon the roots, young citrus trees may still be transplanted with perfect safety if carefully watered and tended afterwards. If many roots are cut away reduce the top in proportion, and in any case cut away soft sappy brittle young terminal shoots, as they will most certainly wilt away.

Citrus trees may be budded now with hopes of securing good growth from the buds this season. Select buds from rounded young shoots growing upon trees of known value. Attend to ties and waxed bands upon trees worked by budding or grafting some time ago. Sometimes an excessive quantity of wax causes the covered portion to decay. For this reason examine the unions of growing grafts. Rub away all shoots emerging from the stock below the grafts.

The harvesting of citrus fruits, particularly oranges, will be almost concluded now, and the sooner the orange trees are relieved of any late fruits the better for their future welfare.

Sprayings with tobacco and soap solutions for the suppression of aphides upon citrus and other trees will save the young shoots from much damage.

Sprayings of Paris green (1oz. in 10galls. of limewash) for destroying codlin moth caterpillars will be in progress at intervals of a fortnight. Early in the month, upon the plains, the bandages should be examined for the presence of the first caterpillars, which have fed in and quitted the young apples and pears. The soil should be kept clean and pulverised around the trees, and no rubbish, sticks, &c., of any kind left to shelter the larvæ. The scaling bark upon the trees should be removed and all knot holes cleanly scraped out.

WEATHER AND CROP REPORTS.

AMYTON.—Owing to the hot weather and strong northerly winds the crops are drying off rapidly, excepting those in the early paddocks, which are filling out fairly well. Through insufficient rain at seeding much of the seed has malted. The average yield will be about 3bush. to 4bush. per acre. Locusts are very numerous, but the crops are too advanced to be much damaged by them. Hay harvesting is over and reaping will soon commence. Most of the early crops suffered lightly from frosts.

BAKARA.—The weather was very dry and hot up to the 22nd, when good rains fell, and cool weather has prevailed since. Crops generally look well, feed is abundant, and stock in good condition.

BALAKLAVA.—The crops do not look as well as at the end of last month, hot weather and winds coming too suddenly after the cool weather of September, and the wheat has been scorched badly in some places. A change came on the 21st, when $\frac{1}{2}$ in. of rain fell, and cool weather set in since. Hay-making is in full swing, and some of the forward crops are turning quite yellow. Have had practically no frosts this spring, excepting a slight one on the 14th, cutting a few vines and melons. Many complaints of takeall have been made, even in new land, and superphosphate appears to make no difference, even where over 1cwt. per acre has been applied. It is thought by some, however, that takeall is not the cause of the trouble.

BOWHILL.—A thunderstorm was experienced on the 22nd, and it was accompanied by a good rain, which broke up a long period of dry and hot weather. The late crops have benefited largely by this rain. The yields will be light. Grass is abundant and stock in good condition.

BRINKWORTH.—The weather was splendid in early stage of month, but towards the end dry winds have been blowing. Stock in good condition.

BURRA.—Nice rains fell on the 22nd which will do good after the hot winds of the preceding week. The crops are about 12in. shorter than last year. Feed is plentiful, and stock look well. Young locusts are numerous.

CALTOWIE.—Splendid weather, and crops are looking well and growing rapidly. Feed is abundant. Stock in good condition. A large area has been put under fallow, which is completed in this district.

CARRIBTON.—During the latter end of September and up to middle of October the weather was very dry, and proved to be a record for this month. A great many crops are going off. The returns in general will be very light. Locusts are doing a lot of damage to the late crops, and also to gardens, some of which are stripped of everything green. The grass is also rapidly disappearing in patches, as the locusts are travelling in strips, especially where there is clover. The outlook for farmers and graziers is not bright.

CONDOWIE.—The weather during the early part of the month was very trying for the crops. A change came on the 22nd, with some rain, which has made things look much better. The crops withstood the hot weather in most cases very well. A good hay crop this year. Rainfall for year to date, 12·97in.

CRYSTAL BROOK.—Hay-making is general and some heavy crops have been cut. Owing to the drying winds during the past few weeks a good deal more hay is being cut than was intended, as the wheat is not filling out as it should. The absence of a good rain this month will mean a difference of thousands of bags here. Stock are in good condition and feed, though dry, is still abundant.

DAWSON.—No rain, crops and pastures are drying off badly, and all that is left is being eaten by locusts. Towards the north and north-east no wheat will be reaped. Some are already moving stock to market or to better paddocks in other localities.

GAWLER RIVER.—The crops are showing the effects of the continued dry weather. Even on well-manured land many wheat plants have died off and look white. In other paddocks they are dying off and giving the appearance of takeall. On the whole the crops are hardly up to expectations. Hay-making has commenced. Stock in good condition, but feed is dying off fast. Gardens look well, and vines and fruit trees have set well, a few very light frosts only having been experienced.

INKERMANN.—The latter part of September and early part of October have been most trying to the wheat crops, not having had enough rain to reach the subsoil. A great deal of wheat is blighted, and what looked most promising, in some cases, will be failures. Feed is plentiful, and stock in good condition.

KAPUNDA.—Grass is plentiful and stock are in good condition. Wheat crops are looking well. Shearing is about finished. Hay-cutting will soon be general, with a crop above the average. The ground is getting hard on the surface. The quantity of wild oats in the crops is less now since the binder has come into general use, but there is more sheepweed and poppy than usual in some places.

KOOLUNGA.—A thunderstorm passed over on the 22nd, with some rain, which will do a lot of good. Hot winds of previous week did a lot of harm to many crops. Hay-making is in full swing. A large area will be cut. The returns so far are very satisfactory.

MAITLAND.—The past few weeks have been very dry, and the crops (especially the late sown) have suffered. Feed very plentiful, water very scarce. There have not been enough heavy rains to fill the dams and tanks. Stock in splendid condition.

MILLICENT.—The weather has been all that could be wished. Crops generally look healthy and well. Feed is good everywhere, and stock of all kinds are in good condition. Every prospect of a prosperous season.

MOUNT PLEASANT.—The crops are progressing well, and promise a good harvest. Stock doing well, and feed is good.

MOUNT REMARKABLE.—The early part of the month was a most trying period for crops. Good rains fell on the 22nd, which will help them to overcome the effects of the hot and dry weather. Locusts are threatening to do great damage. The crops and gardens, notwithstanding the late unfavorable weather, look very promising.

NANTAWARRA.—Stock of all kinds are in splendid condition. Rain is badly wanted, as the hot winds of late have had a disastrous effect on the later wheats, which in some cases will not come into ear. The early varieties will give fair returns. Rainfall for year to date, 12·73in.

OREROROO.—The weather during the past few weeks has been very dry, and the wheat crops have suffered to a very great extent, but since the rains that fell on the 22nd a great improvement can be seen. Feed for stock is yet good, but the locusts are very numerous in places, and are doing a lot of damage. Hay-making is in full swing.

PARKEVILLE.—Have had bad weather during the month with a heavy frost on the 4th, which destroyed the crops on the flats. Hot winds have been frequent. No rain having fallen many crops which had promised 20bush. per acre have been spoiled. In the higher country a good rain would save many crops. The unmanured or lightly manured are suffering least. Stock are doing well, but water is getting scarce.

PENOLA.—Fine weather. Grass is looking green and growing well. Vines and fruit trees look splendid. A severe frost occurred on the 18th, but owing to precautionary measures it was overcome by means of smudges, which saved the vines. White ants nests smeared with tar gave out a good smoke and lasted well. A cold change set in on the 22nd. Total rainfall for year to date 23.17in.

PINE FORBET.—The crops are looking well and give promise of a good return, although they have been severely tried during first three weeks of the month. Good rain fell on the 22nd. Feed is abundant and stock are fat. Shearing is finished and hay-making is general. Rust has been seen in several crops, but only slightly. Takeall is much in evidence.

PORT ELLIOT.—The dry weather has caused the soil to bake and crack. Late crops will suffer unless rain comes soon. Rain to date since January for Hindmarsh Valley, 27.21in.

PORT GERMAIN.—Hay-making has almost finished, with an average of about 26cwt. per acre. Reaping is becoming general. The early sown, on account of their advancement and ability to withstand the hot winds, will give best results. The quality will not be as good as expected, owing to insufficient moisture in September. Some farmers have already out their corn for thrashing, so as to preserve some good fodder for their stock. Stock are in good condition, owing to plenty of feed.

PORT PINE.—The last four weeks have been very dry, without any alleviating showers. Severe hot winds have at intervals prevailed, destroying all prospect of a good wheat yield to the extent of 50 per cent in the shape of pinched and shrivelled grain. Hay-making is in full swing, and the returns will be remarkably good, from 1 ton to 2½ tons per acre; but much of it will be full of wild oats. The Barnaby thistle is spreading over thousands of acres, and all attempts to keep it down have been futile, except cultivation for other crops. Wild mustard is also spreading and growing 7ft. and 8ft. high. Locusts in small numbers have appeared and have reached two miles south of Port Pine.

REIDHILL.—Very little rain this month with several hot, dry winds, which have made some of the crops suffer severely. Those on early, well-worked fallow have stood the dry weather well, and should yield a good crop. Hay-making is in full swing. Feed is plentiful, but is dying fast. Some lambs reared for export have had to be kept longer than necessary, owing to the freezing works not being able to take them fast enough.

ROBERTSTOWN.—The hopes raised by the grand rains of August have been shattered by the unusually dry weather which has been experienced since. The prevailing opinion is that the forthcoming harvest will be worse than last. One redeeming feature is that feed is abundant and stock are in excellent condition.

WILSON.—During the month the weather has been most trying. Hot winds and dust-storms have prevailed. The locusts have done incalculable damage, and, having eaten all the feed on the outside lands, they are now finishing the work left by the rabbits. Many farmers will reap nothing, while some will reap a little seed and others a little more than what they put in. This season is considered one of the worst ever experienced, for, while there will be no wheat harvest, there is no feed whatever for stock.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

November 1, 1900.

Generally speaking, the weather during the past month has been favorable for growing crops, though, as usual, in some districts, as reaping time is approached, the prospects of a good harvest have been marred. In parts of the Northern Areas locusts are ruining the wheat crops and seriously damaging growing feed, whilst the want of rain in other districts during the few weeks before reaping commenced prevented the grain from filling out, so that over many fields the crops present a white parched appearance that must seriously affect the yield. Feed in most parts of the settled districts is abundant, and the outlook in this direction favorable to pastoralists and dairymen, although the recent serious drop in the value of wool will materially lessen the returns for this season's clip. At moment, however, a slight improvement seems manifest.

A healthy tone continues in commercial circles, fair trade doing both in city and country. Mining reports are mostly satisfactory, though the absence of more extensive developments on the Tarcoola Goldfield is causing interest to flag somewhat in that direction; but it must not be forgotten the conditions existing in that dry region must inevitably retard progress during this summer at least, and until water has been provided. Meanwhile some owners of gold-bearing properties are rapidly pushing forward machinery and other mining necessities by camel trains.

The position in the breadstuffs market has not held favorable for the local producers. Values of wheat in Europe have given way a little, whilst freights are, if anything, higher, so that quotations for wheat at Port Adelaide are fully 2d. per bushel lower than when last we reported, and buyers not inclined to operate. Flour, in sympathy, has weakened, but offers

quotations are unchanged. No alteration has occurred in values of feed grains, but trade in these is very restricted. Hay is being bought by dealers and speculators for future trade, the requirements at present being confined to small local demand, as the high rate of freights prevents export business.

What is termed the "new potato season" usually commences about the beginning of September, but this year, owing to severe frosts during April and May, which cut off the young tubers then shooting, the supply of new now being dug is very restricted indeed, and it is, therefore, fortunate for consumers that a late surplus of old season's potatoes existed, and is at the same time giving holders an opportunity of realising fair prices for their stocks. Values have improved for well-kept lots, but out-of-condition samples are very difficult to quit. The same causes have operated with onions, so that values have also further improved.

Lines under the headings of "Dairy Produce" had a good business during the month at prices satisfactory to producers. The supply of butter is now at about maximum, and quality may be reckoned to keep at top grade for next couple of months. An improvement in values of butter in Europe setting in caused a steady firming up here during past couple of weeks, so that some favorite brands of factory prints are fetching up to 1d. higher. Good demand for export bulk keeps market clear at firming rates. The improvement in value of eggs that was showing a month ago resulted in a sharp rise, which, however, was evidently carried a bit too high, as values have since slightly receded, but little, if any, further drop need be feared, as the export demand is very strong. A brisk business in cheese has prevented the fall in price that was expected as stocks began to accumulate, and makers are finding it difficult to get ahead of the demand, so that the complaint of newness of sample has been but little mitigated yet, and prices maintain. A heavy demand for bacon is also keeping stocks clear, but values still rule low, though a firming tendency is showing. Hams are very saleable, and orders for Christmas trade delivery readily obtainable. Honey is quiet. Beeswax inquired for. Good business done in almonds.

With the approach of summer the season for carcass meat and dressed poultry is over. In live poultry a very satisfactory month's business has been put through at rates pleasing to consignors. All lines selling well.

MARKET QUOTATIONS OF THE DAY.

Wheat.—New, at Port Adelaide, 2s. 7½d to 2s. 8d. per bushel of 60lbs.

Flour.—City brands, £6 2s. 6d. to £6 7s. 6d.; country, £5 12s. 6d. to £5 17s. 6d. per ton of 2,000lbs.

Bran.—9d.; pollard, 10d. per bushel of 20lbs.

Oats.—Local Algerian, 2s. 3d. to 2s. 6d.; ordinary stout feeding, 2s. 8d. to 2s. 11d. per bushel of 40lbs.

Barley.—Malting, 3s. 3d. to 3s. 9d.; Cape, 2s. per bushel of 50lbs.

Chaff.—£2 15s. per ton of 2,240lbs., dumped, f.o.b. Port Adelaide.

Potatoes.—Gambiers, £3 15s. to £4; Tasmanian, prime redskins, £4 10s. to £5 per 2,240lbs.

Onions.—Gambier, £10 to £12 per 2,240lbs.

Butter.—Creamery and factory prints, 9d. to 10d.; bulk, 8½d. to 9½d.; dairy and collectors', 6½d. to 8d. per pound.

Cheese.—S.A. factory, 8d. to 9½d. for best matured; good new, 6½d. to 7½d. per pound.

Bacon.—Factory-cured sides, to 6d.; nice farm lots, 5d. to 5½d. per pound.

Hams.—S.A. factory, 7d. to 9d. per pound.

Eggs.—Loose, 6½d.; in casks, f.o.b., 8d. per dozen.

Lard.—In bladders, 5d.; tins, 4½d. per pound.

Honey.—2½d. for best extracted, in 60lb. tins; beeswax, 1s. 2d. per pound.

Almonds.—Soft shells, 5d. to 6d.; kernels, 1s. per pound.

Gum.—Best clear wattle, 2d. per pound.

Live Poultry.—Prime table roosters, 1s. 8d. to 2s. 3d. each; medium cockerels and good hens, 1s. 2d. to 1s. 7d.; ducks, small birds 1s. 6d. to 1s. 9d.; heavy weights, 1s. 10d. to 2s. 2d.; geese, 3s. to 3s. 6d.; pigeons, 8½d.; turkeys, worth for medium birds 5½d. to 6½d.; good table, 6d. to 8d. per pound, live weight.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

TANGLEFOOT.—Take 1½lbs. of resin, 4ozs. treacle, and 4ozs. linseed oil. and boil slowly in an iron pot or ladle till thick enough. Spread thinly on sheets of strong paper. This will catch mice and birds as well as flies. If too thin, add a little more resin. If too thick, stir in a little more linseed oil.

CONFERENCE OF HILLS BRANCHES.

The Fifth Annual Conference of the Hills Branches of the Agricultural Bureau was held at Cherry Gardens on Thursday, October 4, there being present the following members of the Bureau:—

Cherry Gardens: Messrs. R. Gibbins (chair), J. Potter, J. Lewis, G. Brumby, C. Lewis, T. Jacobs, A. Broadbent, H. F. Broadbent, C. Ricks, G. Hicks. Clarendon: Messrs. W. A. Morphet, J. Wright, H. Payne. Morphet Vale: Messrs. L. F. Christie (chair) and A. Ross Reid (Hon. Sec.). Mylor: Messrs. J. Nicholls (chair), W. J. Narroway, W. Nicholls, E. J. Oinn, E. Wilson, H. R. Antuar. Belair: Messrs. W. Bartlett, H. Halstead, and G. R. Laffer (Hon. Sec.). Central Bureau: Messrs. T. B. Robson, George Quinn (Horticultural Instructor), and W. L. Summers (Inspector of Fertilisers).

Mr. R. GIBBINS, Chairman of the Cherry Gardens Branch, occupied the chair, and in opening the proceedings regretted that the weather was so wet that the more distant Branches could not be represented, though they could hardly find fault, after the past few years, with the rain. He hoped the members present would not refrain from criticism; the writers of papers regarded criticism as equally important with the papers. He referred to the grand work being done by the Agricultural Bureau. The attitude of the members was most unselfish and patriotic. They were always willing to give their fellow-members the benefit of their experiences, often bought at considerable cost. The cost of the Bureau to the colony was insignificant compared with the good performed. He would now call on Mr. Laffer to read his paper.

Treatment and Renovation of Old Fruit Trees.

Mr. G. R. LAFFER, of Belair Branch, read the following paper:—

In taking this subject, I did it not because it presented any wide scope to write upon, but more because it seems to me to be somewhat neglected. We have had plenty of papers at different times dealing with the planting and training of young trees, but very few of them deal with orchards, or rather trees after the fruiting age begins. In the first place it seems to me that no definite lines have been laid down to train our trees upon, and most of them are allowed to grow very much after their own particular habit. In this there is something to recommend, as it would be folly to try and train all varieties of, say, apples upon one principle. Take, for example, the Northern Spy, with its upright habit, and the Irish peach, with its willowy downward growth. Here we have the two extremes. What I intend more particularly to deal with are the old trees, of which there are a large number in our hilly districts—many of them splendid specimens of their particular variety. It is also equally true that those trees are not giving the best results obtainable in their somewhat neglected condition. I have seen trees that have broken down with an excessive load of fruit, and no attempt to assist them has been made. The old broken limbs are not even sawn away. I have seen many that have become almost a mass of spur growth. These usually overbear one season, and the next rest from sheer exhaustion. From these trees certainly not the best results are being obtained, as the fruit they bear is seldom of good quality. Most of our bearing trees carry too much wood, and in many cases if one-half or more of this spur growth were cut out not only the quality of the fruit be improved, but the cropping would be more regular. Pears, particularly, are liable to grow too much spur growth. The splendid Winter Nelis gives very poor results generally in South Australia, and I attribute it mainly to the excessive fruit spur system; the blossoming is consequently so profuse that they are weakly and rarely set, and I believe four-fifths of the spurs should be cut out. It is rarely that we see a decent sample of the Scarlet Nonpareil apple in South Australia, as they set such a heavy load of fruit one season which they cannot carry to perfection, and the following season they rest, only to go through the excessive cropping the following year. If they were treated in the way indicated, we should at least have a decent sample, and perhaps induce the trees to carry a light crop the following year. These remarks apply to many other varieties with equal force. In dealing with many of the old trees I would not forget a spraying of pure bluestone or Bordeaux mixture in winter, not so much for fungus diseases as to clear the trees of moss and lichen, besides giving them a healthy growth. In neglected trees it is certainly not advisable to prune too heavily, or cut out too many large branches, as they often start to make a lot of new

wood, which is hard to control unless they are summer pruned. And I should here like to say that no one system of pruning is complete in itself; although most of us only practice winter pruning, it would, no doubt, be a decided advantage to prune in summer as well. Never prune leading growths in summer, only laterals. The leading growths should be pruned in winter when dormant, as it is always well to have the trees making fair growth. If the old trees are not good varieties they can in most cases be grafted to better sorts. I should always advise grafting when the trees are cut down, as they are rarely affected by the shock of the first cutting back. Should the grafts fail to grow, they can be budded in summer, and cut back to the dormant buds the following winter; but I have noticed that the second cutting back often kills the tree, or leaves it in a poor condition, more especially plums, which often burn unless protected from the sun's rays. In trees that are to be worked over I should always advise cutting all limbs off; if any are left to grow and bear fruit, until the grafts are grown, it usually happens that the limbs left rob those that are cut off, and they consequently fail to start any growth. I have had very good results from cutting back old stagnant cherry trees. Often when they appear half dead, if cut back hard they will send out some new shoots which should always be topped back in winter, to induce new strong growth and increased vigor. I should never advise cutting back more than half the new shoots, as it often happens the buds of cherries nearest the base are flower buds. Should it happen that they are cut back to the flower buds they fail to start, and the new growth, that it is most important to foster, is lost. There is another aspect of the pruning question that is rarely touched upon, and I think very important. I refer to the way the work is done. I should very strongly advise clean work. One often sees bad slovenly pruning—branches cut off three or four inches from the base; others cut off anyhow; bark torn and split, causing dry rot; often leading growths cut an inch above the bud, leaving in time a dry end. I consider it is largely a matter of habit, as it is just as easy and quite as quick to work clean. All branches with split or jagged ends could be cut away, as they give excellent cover for moth larvae. There are other things that might be considered such as cultivation, manuring, and spraying. The latter is very important. Professor Bailey rightly says that it is an insurance personally. I consider it one of the most important things that a fruitgrower can do, and I doubt if any work in the orchard pays better.

Mr. GIBBINS asked whether it was not possible to regulate the crops by pruning.

Mr. RICKS asked whether Mr. Laffer would recommend cutting the trees close to the ground.

Mr. LAFFER said the excessive development of the spur system was the cause of the irregular fruiting. If the spurs were reduced to one-fourth in number on many varieties the fruit would be of superior character and more regular in cropping. In cutting back old trees for working they should not leave any limbs on, as was often the case, as they would rob the new growth. He would cut trees up to 6 in. or 7 in. in diameter on or below ground level, but would not cut the very large trees too low, as it would be found exceedingly difficult to get the wounds healed over before dry rot set in, thus affording good shelter for the codlin moth caterpillars. More grafts than required should be made, and when they have made some growth all not required can be removed. The bark will soon heal over if this is done. In regard to ravages of woolly aphis he did not attach much importance to it in his land. Many of his best trees were not on blight-proof stocks. He would almost as soon put in seedling trees as those worked on blight-proof stocks.

Mr. GIBBINS said he had a number of apple trees of fair age which did not grow. Would cutting down and reworking be of any value?

Mr. LAFFER was doubtful. Probably the best way would be to uproot them.

Mr. POTTER thought the stocks were the cause of the failure of Mr. Gibbins's trees. He had, years back, grafted apples on pear stocks, but they did no good. He cut some down below the graft, and put in pear scions. These had done very well, but the apples were practically at a standstill. He believed much of the failure of trees to develop was due to the use of unsuitable stocks.

Mr. ROBSON asked if Mr. Laffer had tried thinning out the fruit, with the object of securing the regular fruiting?

Mr. LAFFER said he thinned his Scarlet Nonpareil apples pretty well last

year with fair results, but he was convinced he had not done the work as severely as it should have been done. He believed it would be found much better to thin the spurs and save the strength of the trees.

Mr. REED referred to pear trees 30ft. high, a mass of spurs, which flowered profusely, but failed to set fruit. It would be a large contract to thin the spurs. Would it be practicable to cut out a few branches, and thus reduce the spurs?

Mr. LAFFER said much would depend on circumstances. Thinning of spurs was not such a long job as might be thought. He had last winter spent two or three hours on an old Duchess pear, which flowered profusely previously, but set little fruit. If only one fruit spur in ten were left it would be of great advantage. He was well satisfied by the result of his trial. He got more and better fruit where the spurs were thinned out as suggested. He would remove the spurs underneath the limbs, leaving the side growths.

Mr. RICKS would rather cut the old trees down and rework them.

Mr. JACOBS found some of these old trees can be brought into bearing by cutting the bark all round when dormant. On one or two trees he had got good crops each year since he had performed this operation.

Mr. QUINN said the question was a very large one. The practice of ringing the trees, or root pruning, to produce fruit was very old. As, however, its results came from the weakening of the vigor of the trees, care must be exercised. Pruning the branches, on the other hand, encourages wood growth. The matting of spurs of pears is largely due to neglect of attention in their early stages of growth. Weakness, caused by excessive sub-division of the spurs on the tree, would appear to cause degeneration of the flowers, so that but few set fruit. Exceptional vigor has a similar effect. Neglect in cultivation and manuring was a frequent cause of orchards becoming unprofitable. Cultivation must always be regarded as making the plant food in the ground available in addition to conserving moisture. In Victoria great attention is paid to the manuring of orchards, and with satisfactory results. Green manuring was also receiving attention, peas being sown with first rain, and ploughed under early in spring. Chemical manures alone never give results equal to stable manure, unless there is plenty of organic matter in the soil. As stable manure is not obtainable for large areas, the organic matter must be supplied by green manuring. The cutting back of apple trees and reworking at ground level will not always pay, owing to ravages of woolly aphis. Mr. Laffer did not seem to have much trouble with these insects, but in other parts they would soon prevent any profitable returns being obtained. It was important that, in pruning, clean cuts be made. Often the pruner cuts about midway between the nodes, with the result that the wood decays, and this decay will extend below the bud giving rise to the leading shoot, often causing failure of the leading shoots.

Mr. ROBSON had experience with large Jargonelle trees which failed to bear. He cut down all the highest upright branches, leaving the horizontal branches up to 10ft. in height, the results being very satisfactory.

Mr. RICKS asked whether the growing of crops between fruit trees was advisable.

Mr. LAFFER objected to any crop that was not cultivated, or remained on the land until too late to cultivate. Even peas, unless ploughed under green, will injure the trees. Strawberries, which must be cultivated to secure a crop, do no harm as far as he could see. Potatoes, which must be manured and cultivated, would probably be of advantage to the trees.

Mr. POTTER found that the cultivation of potatoes, if manured, was distinctly advantageous to fruit trees.

Mr. ROBSON found winter crops not harmful, but the ground must be cultivated.

Mr. ANTUAR found growing what were usually called "hoed crops" was all right, but oats, or wheat for hay, was injurious. He had some experience of woolly aphis at Norwood seven or eight years ago. They cleared the soil from most of the roots, and then gave a good dressing of fresh horse droppings. This seemed to have a marked effect for a number of years, and he was inclined to attribute much of the injury to poverty of the soil.

In reply to question, Mr. LAFFER would not recommend growers to use seedling stocks, irrespective of local conditions. While he got his best returns from seedling trees, he had seen numerous instances where such trees were absolutely useless, owing to the knots and lumps caused by woolly aphis. These afforded splendid harbor for codlin moth caterpillars. He would not recommend cutting down the old pear trees if they were good varieties. The thinning of the spurs or cutting on the method adopted by Mr. Robson saved a tree from which they sometimes got £3 to £4 per year. His visit to Victoria had caused him to think there must be something in spraying with arsenical compounds for codlin moth. Many growers there were strong advocates of this practice, and he believed where the spray pump can be conveniently used, it will pay to spray.

Mr. QUINN said at Harcourt, in Victoria, Mr. Lang, a large grower, had found that by removing nearly three-fourths of the spurs on Winter Nelis pear trees he obtained good and regular crops from this usually shy bearer. He obtained from 6bush. to 10bush. from a fair-size tree treated in this way. The time occupied in thinning out the spurs need not be an objection. It was not necessary to go over it all in one year. Mr. Lang went over each tree once in every five years—that is, he did about one-fifth each year.

Mr. QUINN asked whether Mr. Laffer found it generally profitable to spray for insect and fungus pests.

Mr. LAFFER said he was most emphatic on this point. Spraying for codlin moth had not had a fair trial, but in regard to scab of apples and pears, apricot shothole, and other diseases, no reasonable orchardist could doubt the efficacy of Bordeaux mixture. He was probably the first south of Adelaide to use a spray pump. He reckoned that he made a profit of over £40 the first year on his outlay. It was not only in preventing damage by fungi, but also in clearing the trees of moss and lichen, and in generally improving the health of the trees.

Mr. POTTER asked whether there was much in favor of the practice of summer pruning of fruit trees by breaking the shoots.

Mr. LAFFER said yes, if properly applied, but otherwise it would do more harm than good. He had seen very good effects from the practice. With apples it saves much cutting out of limbs. They had much to learn in regard to pruning, and, though many growers spoke slightly of theoretical knowledge, he always found he obtained most information from the man with a good theoretical knowledge of plant growth. Amongst growers there was a great lack of this knowledge, which would explain many things which were otherwise difficult to understand.

Mr. QUINN said the practice of breaking, but not removing, the shoots during summer was very old, and had been proved by years of experience. In the forming of young trees it was of great use. The main shoots are not, of course, treated, but the laterals. The practice saves the strength of the tree being wasted, and causes the buds to develop into fruit spurs instead of wood growth. The work must, however, be done at the proper time, and with judgment. The broken shoots must not, however, be cut off clean the following winter. If cut cleanly the bud is likely to go to wood again.

Mr. ROBSON said in picking their early peaches they broke off the tops of the strong shoots in the centre of the trees to place in the boxes. They found the trees so treated bloom and bear well the following year on those shoots.

Mr. OINN said after the Mylor Conference three years ago he tried this breaking of the shoots of apples on some Strawberry Pippins with great success.

Manures.

Mr. CHRISTIE tabled samples of wheat grown with and without manure. Those with manure were about 4ft. 6in. high, those without manure only 18in. high and not in ear; 150lbs. mineral super. per acre was applied with the drill.

Mr. LEWIS showed wheat from ground that a few years ago failed to produce a crop. Last year peas were sown with 3cwt. Thomas phosphate per acre, and this year sown with wheat and 1½cwt. bonedust. The crop promised equal to 2 tons of hay per acre. Without manure there would not have been a crop worth reaping.

General Farm Management.

Mr R. GIBBINS read a paper on this subject to the following effect:—

In dealing with the management and general treatment of a farm there is much to be said about the situation, size, and general characteristics. I purpose dealing with holdings from say 100 acres to 1,000 acres of average farms in the districts of which the members of this conference are mostly interested. Generally the first thought is to provide a comfortable home for wife and family. A house can be made comfortable, and yet not expensive. It would be a great mistake for a man with limited means to build an expensive house, and then find he has not sufficient capital to carry on work, &c., that is absolutely necessary to make his farm a success. It is an easy matter to enlarge and improve a house. The next consideration is to get the farm substantially fenced and subdivided. Good fences make good neighbors. In this district mixed farming will generally prove the most profitable, interesting, and enjoyable. Dairying in the southern districts is one of the most profitable, and where there is a large family it is necessary, as nearly half a living comes from this source. Do not overstock, either with cattle, sheep, or horses. Be sure that the cows are healthy looking, with rather small forequarters and head, with forehead rather broad and tapering to the nose, with square hindquarters and udder, and teats well set apart. The most essential point is the pasture. It matters not what breed, or how good a cow may be when in milk, if she has not sufficient green fodder, she will not produce a large quantity of milk or butter. I have known cows make 12lbs. or 14lbs. of butter a week, with abundance of green fodder, and the same cows could only make 3lbs. or 4lbs. with nothing but dry food. It is a great difficulty to get a good average on farms that cannot grow fodder in summer and autumn. If you have to feed bran and chaff, the cost is nearly as much as the returns. The ordinary shorthorn is the best all-round cow. Every farmer should breed his own stock, and he should be particularly careful in selecting the sire, for as a rule the sire is of much more importance than the dam. The best cross with a shorthorn cow for dairying purposes is an Alderney or Ayrshire bull from a good strain. Breed only from the best cows, and always try and get the calves early. Those that are calved in April or May should have as much new milk as they can take the first week, and then gradually wean them off to skim, but keep them in good condition, and they will be ready to turn out when the spring grass comes on, and will grow very fast. Animals stunted when young will never develop into good robust cattle. Never allow the heifers to be served at least under two years old. If these heifers are by an Alderney or Ayrshire bull they should then be put to a good shorthorn bull, as the surplus stock is valuable as beef producers. Everyone keeping six or more cows should have a separator, the capacity of which should be according to the quantity of milk produced. Get one that will put through more in a given time than less. Through having too small a separator there is much valuable time lost in separating. There is no necessity to separate more than once a day if you have a separator of sufficient capacity. If you separate in the morning the night's milk can be mixed with the new, and the temperature made about 95° F., which you will find about right to obtain good results. When butter goes below a certain price those that have suitable positions should make cheese. In connection with the dairy a certain number of pigs should be kept, according to the quantity of skim milk and other waste produce. A good Berkshire sow crossed with an Essex boar is a very profitable pig, and its progeny can be sold as porkers or fed longer, and will make first-class bacon pigs. When corn is used, if possible, always grind it into meal, and mix with the milk a few hours before using. In winter it is absolutely necessary to keep them dry and warm, and their food should also be warmed before feeding; it will amply repay the extra labor. Every farmer should keep only a sufficient

number of horses to do his work, and should cultivate enough crop at least for his own use. In selecting the draught stock some mares should be included for breeding purposes, and great care should be exercised in their selection. It is very advisable for any man who wants to buy, and is not a judge, to get the opinion or advice of a practical man. Special care must be taken in selecting the sire, as only horses of a good useful class should be bred. It is painful to see the number of useless animals now overrunning the country, and it is a difficult matter to procure a really good draught or carriage horse at the present day. There may be two entires travelling a district: one really good, with a good pedigree, and another with a made-up pedigree. The fee for one is, say, £3 and for the latter only 30s. Cost of service induces one farmer to pay 30s., whilst wisdom induces another to pay £3. It is to be supposed that the mares in both cases are equally good, but one owner is a fair judge of a horse, whilst the other does not know much about the matter. It may happen, and does happen sometimes, that the mare put to the cheap horse will impress her progeny with her own good character, but this is rare. The horse with a good pedigree almost invariably begets superior stock when put to a good mare. The result of the expenditure would possibly be that in three years the £3 colt would be worth £15 to £20, whilst the 30s. one would be worth no more than £5 or £6, but would have cost just as much as the other for cost and care in the meantime. It would place thousands of pounds in the pockets of farmers if no one were allowed to keep an entire for public hire unless the same has been examined and pronounced sound, fit, and up to a certain standard. Where the holding is large enough a small flock of sheep should be kept for improving the land, to provide mutton for the family, and to supply wool for sale. Good Merino ewes are not so bad for fences as crossbreds, and their wool is generally more valuable. These, crossed with the Southdown or Shropshire rams, make an excellent lamb for shipping purposes, and command high prices in the local markets. In many parts of the south fruit-growing has been sadly neglected in the past. There are hundreds of acres most favorably situated for the profitable growth of various kinds of fruits that are at present only lying in waste, and when we consider these can be produced without irrigation—the quality is much firmer and keep longer—surely we ought to be able to compete with colonies that have to go in for the heavy expense of irrigation and a long distance from the market. Suitable fruits will command good values for years to come, having markets like Western Australia, Broken Hill, Port Pirie, Africa, and many others. Of course growers will have to be careful in selecting the best kinds to grow and situations most favorable for the various kinds. Producing various kinds of crops, &c., will prove by far the most profitable. Do not have all your eggs in one basket. Poultry should be kept for home use and eggs for market, but not in large numbers, as they are very destructive about a farm, and if properly fed very little profit. No farmer or other person should neglect to grow at least sufficient vegetables for home use. I think you will all agree with me that fruit and vegetables are never so nice and wholesome as when you can gather when required. There are also many farmers that could grow vegetables for market with much profit. With regard to the family where a boy shows special qualifications for other professions or trades, and takes no interest in farm work, it is the duty of the parents to do their utmost to give him all the advantages possible to follow it. No boy or girl will make any calling much of a success if they have no liking for it, nor take any interest in the matter. Every girl should be taught the domestic duties of a home, cooking being one of the most important.

Mr. RICKS said if people with small holdings in the Hills would devote the same attention to detail as such men as Mr. Laffer paid to fruit-growing, they would find dairying most profitable. Sheep were good in their place, but he thought a mistake would be made if too many things were attempted. The small holder should make himself expert in a few lines and stick to them. They had to compete with the whole world, and unless they produced the best at the least cost they would fail. In the Hills 100 acres to 200 acres of average land well managed would return more to the owner than 500 to 1,000 badly managed. He strongly advocated the growth of green feed during the summer. Very few in the district attempted it, the result being that the milk supply in the summer fell almost to nothing. He had no hesitation in saying that on every section in the district some green feed could be produced without irrigation. Cultivation was, of course, essential. The Shorthorn cows were too large for the hilly country. The best to keep was the Ayrshire-Jersey cross, or pure Jersey. It was ridiculous to attempt to produce cows that would be profitable as milkers and then be good beef cattle when their milking days were done. The social side of farm life was of great importance, but did not receive the attention it should.

Mr. JACOBS considered it a mistake to get too many crosses in their dairy cows. They should get the best for the district and perfect the strains as much as possible. Some years back the Branch came to the opinion that the Ayrshire cross would be best, and a bull of that breed was obtained. It would be a mistake now to introduce Jersey and Shorthorn strains. As far as he had observed, the Ayrshires and crosses kept in much better condition than others in the rough country. The Jersey was too soft. In regard to pigs he strongly supported the Berkshire. Would the Berkshire-Essex cross bring a higher price per pound in the Adelaide market than the Berkshire?

Mr. GIBBINS said this cross invariably beat the other in price.

Mr. POTTER followed Mr. Ricks to a large extent. Sheep had no business on some of their holdings. Where the rainfall was less, and there was not so much opportunity of growing different crops, sheep were all right. He admitted the necessity for improvement in horse stock, but objected to the proposed stallion tax. He would not mind if it was intended only to allow pure-bred or good stallions to travel, but to tax all stallions and allow them to be used, whether good or bad, as proposed at Congress, was another thing.

Mr. SUMMERS thought the intention of the resolution passed at Congress was that only sound horses should be allowed to serve for hire, and that a licence-fee should be imposed to cover the cost of examination by a veterinary surgeon. How could the veterinary say whether the horse was pure-bred or suitable for use by farmers and others?

Mr. POTTER insisted that the resolution suggested a tax on every stallion whether sound or not. [The licence would *not* be granted to any except sound animals. The examination would be farcical otherwise.—GEN. SEC.]

Mr. A. ROSS REED considered no interference necessary in this direction. The matter lay in their own hands. If they would pay a reasonable fee for service they would get good stock to travel, but a man would not pay £150 to £200 for a good draught stallion if he could not get a reasonable return. In regard to sheep and dairy cattle he admitted the latter would return more, but the difficulty he and others had was that they could not get their men to look after the cows properly, whereas sheep did not require such constant attention.

Mr. ROBSON considered poultry properly managed were a source of profit.

Mr. GIBBONS found his fowls did not pay, and many others in the district had similar experience.

Mr. QUINN thought one important matter bearing directly on farm management was missed, and that was the question of education. He could not help noticing in travelling about the want of practical education amongst cultivators of the soil. There was much now taught that might, in his opinion, be dispensed with for subjects which would be of practical benefit to the children in after life.

The Cow on the Block.

Mr. E. WILSON read a paper on this subject, as read at meeting of Mylor Branch on October 27, 1898, and printed in *Journal of Agriculture* November, 1898, pages 376-8.

Mr. H. BROADBENT asked for Mr. Wilson's authority for statement that one cow would keep a sow and her litter in milk.

Mr. J. POTTER asked whether it was possible to grow enough on one acre to keep four cows.

Mr. ANTUAR said Mr. Wilson was not far out. It was wonderful the quantity of green stuff that could be produced from an acre in one year by keeping the land under crop the whole year. Heavy crops of cabbages are produced, much of which was wasted. Turnips would yield a very large return in three months. As soon as this was harvested something else must be put in,

and so on throughout the year. The crops must of course be well worked and manured. They could grow at Mylor green feed throughout the summer and winter.

Mr. WILSON did not say the cows would receive nothing but the produce of one acre of land. By intense culture and using all they could produce, it would go a long way to keeping the cows.

Mr. WRIGHT would not say that four cows could be kept on the produce of one acre, but he was confident that a vast improvement was possible, and within the reach of all in this district at any rate. Green fodder was scarcely grown at all, not because it was unsuitable, but because the people would not try to grow it. The cows were usually turned out in the paddocks to forage for themselves, with the result that the milk supply when the grass became scarce fell off to such an extent as to seriously hamper the operations of the factory. It certainly meant more work to carry out Mr. Wilson's ideas, but they could keep more stock, and the returns would be much better. There were men in the hills producing more from twenty acres than others from eighty or 100 acres of equally good land.

Mr. RICKS said Denmark was an instance of what could be done by intense culture and attention to details. Before they went into the dairying industry it was one of the poorest states in the world, but now it was very flourishing. It they could afford in Denmark to stall feed cows for six months of the year at least, surely here, where the climate was so much better, it was possible for us to approach their results in the dairying industry. He had no hesitation in saying that the land in the hills did not produce one-fourth of what it might do. Even in a dry summer there were portions of every section in the district that would produce green feed. Certainly thought and labor were necessary, but it would pay.

Mr. WILSON said there were throughout the Mylor blocks small areas of very rich ground which could be made to produce feed of one kind and another throughout the year. Market gardeners did not leave their land idle for long; they took off three crops a year from the land, and this is what we must do in the way of intense culture. With these small blocks they could not afford to leave the land idle for a single week.

Mr. OINN did not think the blocker, with his small holding, could have too many varieties of produce, as he had then more opportunity of realising a profitable return for his work. He must have a number of irons in the fire; but the blocker that was successful must be able to keep them all hot. With a cow he could use up a lot of stuff that would otherwise be wasted. The cow not only saved expense, but brought in a fair return for the labor. As far as he could judge the Cow Club at Mylor, formed as a result of Mr. Wilson's efforts, had been a success, and he was sure that it would be possible to keep the four cows on the produce of an acre in the way suggested.

Mr. QUINN asked if any had grown lucern at Mylor, and how many cuttings a year they could get.

Mr. NARROWAY had grown lucern and clover, and obtained four cuttings a year, equal to 6ft. of growth. This would go a long way towards keeping the cow.

Mr. JACOBS admitted that with water they could grow green feed at Cherry Gardens in the summer, but it was impossible, except in favored spots, to do it without irrigation. Most of them had not a single acre that could be irrigated in summer without lifting the water.

Mr. RICKS had grown maize on a dry hillside up to 6ft. in height. He had sown rape and mustard on dry land in January and it was 20in. high in March. This had been done year after year on small plots, and could be largely extended.

Mr. ANTUAB said it was a mistake to think they could grow all sorts of things on every block. Judicious selection was necessary. Where there was sufficient moisture they should grow early maturing crops. He had dug land on a hillside in May, sown it with peas which he had taken off at Christmas, and then put on maize which grew 4ft. to 5ft. On the good black soils cabbage or turnips could be grown, and when they come off put in potatoes or carrots. In the lower portions piemelons and pumpkins can be put in. It was necessary for them to watch every opportunity to utilise the land.

Mr. STRANGE said green feed could be grown in the locality, but they must not lose sight of the fact that to obtain a crop they must first put something into the soil in the shape of manure. On very poor land, from which they had taken out tons of stones, they had a crop of peas equal to anything in the district. The land was given a good dressing of bonedust. Where no manure was applied the crop was of little value. He grew large numbers of cabbages, and found the leaves good feed for cows. It was often objected that cabbage would flavor the milk, but he did not find it so. His cows received a good feed of cabbage just after milking; if fed just before milking probably injury would result. These cabbages were grown on hillsides which were often said to be of little value. As 10,000 to 12,000 cabbages, weighing up to 6lbs each, could be grown on an acre, it would be seen that a large quantity of feed could be raised from this one crop. His six cows received 5doz. or 6doz. cabbages daily.

Mr. QUINN referred to the immense quantities of lucern raised on the Adelaide plains by irrigating with water raised from 20ft. to 30ft.; also to the heavy crops of mangolds produced where the land was manured liberally and well cultivated. Many men succeeded in growing heavy crops of various kinds where others had failed.

Mr. BROADBENT admitted that splendid crops of green fodder could be grown in the summer on the flats and damp spots. He had grown maize nearly 12ft. in height, but Mr. Ricks went beyond the mark when he said it could be grown on any section of land in the district.

Mr. ROSS REID said Morphett Vale district was much drier than Cherry Gardens, yet, if they prepared the land properly and cultivated it, they could always depend upon a fair crop of sorghum. Two years ago, when the season was so very dry, it reached 5ft. in height, and he was sure it could be grown here, provided the land was well tilled.

Mr. LEWIS said sorghum on well-fallowed land had often failed in this district when good crops were obtained on the plains, notwithstanding the rainfall was heavier.

Soils and Fertilisers.

Mr. H. R. ANTUAB read a very lengthy and somewhat technical paper dealing with the formation, varieties, and constituents of soils, and their cultivation and treatment; also upon "The Life of a Plant," "Rotation of Crops," "Green Manuring," and "Fertilisers." The following extracts are taken:—

Rotation of Crops.—The principles upon which a regular system of rotation of crops is based are:—1. That all crops exhaust the soil, but in an unequal degree. 2. Plants of different kinds do not exhaust the soil in the same manner. 3. All plants do not restore to the soil a like quantity of manure. 4. All plants are not equally favorable to the growth of weeds. This system gives time for the action of the air, heat, rain, &c., to prepare new material from the soil for the support of plants. Though the system is adapted to every soil, no particular rotation can be assigned to any one description of soil that will answer at all times. On clay soils beans, clover, and rye grass are usually alternated with grain crops; on dry loam or sandy soils turnips, beet, potatoes, and clover are used. On rich lands this system of rotation will conserve fertility for a long time, and result in continuously heavy crops. But on average arable lands rest under pasture and the addition of natural or manufactured fertilisers will often be necessary.

Soils.—In the hilly districts the soils seem to vary in character on almost every rod. They may be classified as loams, clays, sandy, or peaty. The loamy soils are best, but the others may be improved by addition of constituents in which they are deficient. In Mylor district the clay soils are invariably found on the south-westerly exposed sides of the hills, being what was once the subsoil from which the original surface has been denuded. To restore these soils to fertility will be very costly, but when restored they will be immensely productive. Commercial fertilisers would be thrown away on them, but large quantities of sand and lime, also ashes, will restore the perfect mechanical condition necessary. Sandy soils will be greatly improved by additions of clay, gypsum, or loam, and will also readily respond to good dressings of farmyard manure. Peaty soils are heavily charged with acid matters, which it is necessary to neutralise either by fallow or with a heavy dressing of quicklime. In some cases it is advisable to pare the surface and burn it. The "goodness" of soil depends upon its capacity to retain the proper quantity of moisture for nourishment of the vegetation and no more. The retentive power increases with the proportion of its clay, lime, or magnesia, and diminishes as the proportion of its sand increases. Decayed vegetable matter, or humus, is a very important constituent of good soils, and if either nitrogen, phosphoric acid, or potash are deficient the deficiency must be supplied. Lime should be fresh from the kiln, as it soon becomes deteriorated by exposure to air and moisture.

Lime.—On soils not naturally abounding in chalk or other calcareous matter there is less danger of giving rather too much than too little lime, except where an over-luxuriousness is to be dreaded. It has been urged that, although lime promotes vigorous fertility at first, in the end it makes the soil more sterile, and therefore it ought not to be used. But this is a weak argument. By use of lime several successive crops may sometimes be secured, but it would be marvellous if the soil were not impoverished when nothing whatever is restored to compensate for the plant food removed in those crops. The lasting effect of lime on the soil can only be measured by the quantity and quality of the lime, the nature of the crops raised, and many other circumstances. The effect of liming on soil will last for an indefinite time. Peas and other legumes cannot be profitably grown on soils which contain no lime or calcareous matter. There are few subjects on which farmers are more divided in opinion than upon the quantity of lime that might be used upon an acre of land with profit or even safety. Some advocate 30 bush. or 40 bush. per acre, whilst others would not hesitate to use 300 bush. to 400 bush. No doubt there is great variation in the nature of the soil, the state of cultivation, the quality of the lime, the nature of the manures that have been applied to the soil, and the way in which it has been applied. Some limes contain a good deal of impurity. The cost of lime in some cases prevents its use in great quantity, but it has often been proved that its effect has been to promote a high degree of luxuriance in crops when applied in large quantities where needed. On peaty soils it is undoubtedly more beneficial than anything else during the first two years. Two hundred bushels per acre can be used with great benefit on peaty land. Lime applied to land does not destroy nitrogen, but it is very injurious if applied to the manure heap, because it then drives off the ammonia. It causes reversion of phosphates and other soluble fertilisers, and fixes them in the soil, so that these valuable plant foods cannot be dissolved and leached out. Not only are these substances thus locked up in the soil, but they are retained there in a readily available form for the use of the plants. Lime is a powerful oxidising agent, and neutraliser of acids injurious to plant life. On calcareous soils there is an almost total absence of weak grasses, such as fog and sorrel. This is owing to the neutralising of the acids necessary to the existence of such plants.

Mr. STRANGE agreed that it was necessary to know when, why, and what manures to apply. Take sulphate of ammonia and apply it to French beans, the result will be nil. Apply it to cabbages or cauliflowers, and the result was marked. Then, again, many people did not know how to use bonedust. In winter it only wants working into the surface, the rain will carry it down; but in the summer it should be dug into the ground or it would not decay as quickly as desirable. Then they wanted fine bonedust, not coarse stuff that would remain in the soil for three or four years before it became available to plants.

Mr. SUMMERS said many growers were complaining of the rise in price of bonedust. This rise was almost entirely due to the action of a few growers who demanded a cheap article. Some bonedust sold at over £5 per ton contained up to 25 per cent. of material, some of which was undoubtedly of value, but could be obtained separately at £1 10s. per ton. Of course the maker of this stuff could supply at a cheaper price, and at the same time pay more for the raw bones than the man that manufactured bonedust from bones alone. It was the competition for the raw material, engendered by the demand for cheap bonedust, which had caused the rise in price. He was glad to say that four out of five growers insisted on being supplied with a good material, and he

regretted that the ill-advised action of a few should have had this unfortunate effect of causing the before-mentioned rise in price. He strongly advised them not to purchase these so-called cheap manures without first satisfying themselves that they were obtaining good value for their money. In regard to super. being lost, he believed experiments had proved that there was little danger of this unless applied a long while before the land was cropped, and even then loss would only occur by leaching in rare cases.

Mr. ANTUAR said on their deep peaty soils the water would carry the fertiliser in super. out of reach of the roots, and although it might not be lost, it was certainly of little value to the gardener there. Finely ground bonedust would be far more profitable. He thought the Fertilisers Act should contain a provision compelling manufacturers to show the degree of fineness of grinding. In regard to stable manure, he considered the hills gardeners often wasted their money and the strength of their teams in hauling the stuff. The fertilising value of the stable manure from town was often very low, and though the bulk was valuable, they could get better value from green manure crops at less cost. they should make the best possible use of what they produced on the land. As an instance of this, he might mention a blocker in his neighborhood who drained the liquid manure from the pigsty into a tub and used it in his garden; the cowyard drainage was similarly treated; and the man told him that the manure from the pigs alone was worth £5 a year to him. He found that the land throughout the hills was notoriously deficient in lime and salt. On new land lime gave better results than bonedust or other manures. It was necessary to bring the soil into a fit condition for plant growth before manuring would be profitable, and lime by its sweetening action, and also its effect on the mechanical condition of the soil, did this.

Mr. QUINN found that more and more attention was being paid by scientific inquirers to the action of lime, and, though some of its effects were obscure, all recent observations had shown that it should be more largely used than in the past. The idea that the lime should be crushed, and not slacked, did not tally with European experience and practices where the lime was allowed to slack a little—just sufficient to reduce it to a powder—before being worked into the soil.

Next Conference.

Decided to hold the next Conference at Mylor, in October, 1901.

Vote of Thanks.

Votes of thanks to the readers of papers, the visitors, the Chairman, and the Hon. Secretary closed the Conference.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, OCTOBER 22, 1900.

Present—Messrs. F. E. H. W. Krichauff (Chairman), W. C. Grasby, T. B. Robson, and A. Molineux (Secretary).

Railway Carriage of Fertilisers.

In reply to resolution passed at the recent Congress, that the Government should be asked to carry commercial fertilisers on the railways at lowest rates and that the time allowed for unloading be extended, the Railways Commissioner intimated that fertilisers were now carried at lowest rates, viz., 7s. 4d. per ton per 100 miles, and that it was not possible to extend the time allowed for use of truck without demurrage, though every consideration would be extended to consignees living at a distance from the railway station.

Licensing of Stallions.

The Hon. MINISTER OF AGRICULTURE intimated, in reply to resolution passed at Congress, that this matter was already before Parliament, and the Government were supporting the matter in the form recommended by the Bureau, viz., that all stallions travelling for hire should obtain a licence, such licence to be granted on the animal being passed by a competent veterinary surgeon.

Attendance at Central Bureau Meetings.

Members referred to poor attendance at Central Bureau meetings and the necessity for effective action being taken to secure a more regular attendance of members. Mr. Grasby gave notice of motion for November meeting as follows:—"That in order to secure a more regular attendance and more effective work the constitution of the Central Bureau be altered, so that any member, other than officers of the Department of Agriculture, failing to be present for four consecutive meetings without reasonable excuse be deemed to have forfeited his seat."

Smyrna Figs.

Mr. ROBSON reported that the sub-committee appointed at previous meeting had dealt with the matter of the importation of cuttings of the different varieties of Smyrna and Capri figs, and Mr. Holtze had already written for the cuttings required.

Extracts and Translations.

The CHAIRMAN tabled the following extracts and translations from Foreign Agronomical Papers:—

Poison in Potatoes.—According to the latest inquiries made by Professors Schmiedeberg and Meyer old potatoes contain more solanin than those freshly dug, perhaps three times as much, and if they have sprouted five times as much, and with very much more in the sprouts. If peeled before boiling the water extracts much of the poisonous solanin, but this is not the case if boiled with the skin. Potatoes when sprouted should not be given to animals, as the boiling does not remove the poison. If fed with them they become lame in the knees or altogether, and sometimes they die.

Forests.—Greece is now in real earnest in planting forests, under the control of a German forester. Public opinion has now come to see that the climate is suffering with the destruction of forests. The King and Princess Sophia have made large plantations.

Molasses or Sugar for Horses.—The horses of the American cavalry and artillery in the Philippines would not feed well on the hay, and became very weak. They then received 1 lb. of brown sugar or molasses to every 8 lbs. of the hay, and soon recovered.

Sulphate of Ammonia and Nitrate of Soda. Professor Dr. Maereker compares these nitrogenous manures, and comes to the conclusion, after many experiments, that, provided the price of the unit is pretty nearly the same, sulphate of ammonia can be used in place of nitrate of soda, in some instances with even better results. On the whole nitrate of soda gives 10 per cent. better results, but when per hectare 2 cwts. were applied to winter wheat in autumn and again early in spring, against 2 cwts. 35 lbs. of nitrate of soda at the same times, the sulphate of ammonia gave 538 lbs. more grain and 584 lbs. more straw. But it is quite different if the wheat is only manured in spring, when the nitrate of soda had 270 lbs. more grain. Experiments with sugar beets showed hardly any difference as regards quantity, but the sugar contents were 0.9 per cent. less with nitrate of soda; the roots contained more water.

Tethering.—This practice is rapidly spreading from Denmark through Schleswig-Holstein, Mecklenburg, and Holland. Dairymen see that it is not only necessary to produce good fodder for the winter, but also to make good pasture last as long as possible. Cattle running over a field destroy much fodder in looking for the best and youngest, of which they bite, after all, only the tenderest part. The cows thus also give themselves less rest. It is calculated that from 20 per cent. to 30 per cent. of fodder can be saved while cows are depasturing. It should be also considered that the feed is early in spring so rich in protein that much of it which the cows run after is not well digested, and so lost. Another advantage is that you can make use of the feed in enclosures which are otherwise under crop. You can better observe whether poisonous plants are present, and prevent horning and butting of cows. Mr. Stahlberg, near Lubec, stated that he had kept forty-eight cows on seventy-five acres by moving them every three hours during the day. The ropes or chains are from 8 ft. to 9 ft. long, and have two

swivels, one near the head, the other near the peg, which is best made of iron, and about 3ft. long. After two or three days cows become accustomed to tethering. In some districts tethering might be tried here during spring and up to Christmas with advantage.

The Onion Maggot (*Anthomyia ceparum*) produces the rottenness of onions after it has passed through them in many directions. As soon as the leaves begin to look yellow pull the onion up and burn it; then spread ashes and root over the land. Never plant onions on the same land two years following each other. I have also spread soot over the land before planting.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Rhine Villa, Messrs. A. Lewis and H. Groth; Naracoorte, Mr. E. R. Peake; Mount Remarkable, Mr. H. N. Grant; Nantawarra, Mr. Gustav Belling; Arthurton, Messrs. H. I. Freeman and S. T. Lamshed; Gumeracha, Mr. H. W. Nosworthy; Hawker, Messrs. J. Fisher and J. Moller; Onetree Hill, Mr. M. G. Smith; Meningie, Messrs. W. Tregilgas and W. G. Wilks; Cherry Gardens, Mr. W. B. Burpee; Mount Compass, Mr. S. Herring; Mount Bryan East, Messrs. John Wilks and B. Dunstan; Eudunda, Mr. J. A. Kluske; Paskeville, Mr. R. Hamilton.

Reports of Meetings.

The SECRETARY reported receipt since previous meeting of fifty-six reports of Branch meetings.

REPORTS BY BRANCHES.

Rhine Villa, September 8.

Present—Messrs. A. Payne (chair), H. Mickan, C. Groth, H. Modistach, H. Payne, J. Vigar, W. Farey, G. Schick (Hon. Sec.), and six visitors.

EXHIBITS.—Mr. Schick tabled some choice vegetables grown without irrigation.

BRANCH BUSINESS.—Members wished to know whether any but members could read papers at Bureau meetings. [Certainly, yes. If the members offer no objection, the Chairman may allow visitors to speak or read papers at Bureau meetings.—GEN. SEC.].

PAPER.—The Hon. Secretary read a paper on “Why Farming in Many Instances Does Not Pay” to the following effect:—

Every person commencing farming should be possessed of four main factors to ensure success. These are capital, knowledge, perseverance, and energy. He had little hesitation in saying that the majority of failures in farming operations were due to the absence of one or more of these qualifications. Land must be secured, and it is best to have the freehold paid for; but if that cannot be managed, the next best thing is to take up the best land that can be leased from the Crown, and try to pay up two or three years' rent in advance so that no trouble shall arise if one or two bad seasons should follow first occupation. All implements, goods, stores, and other articles should be paid for on delivery. A man is literally a slave when he is in debt to agents, tradesmen, &c., as he must take his produce to them and let them have it at their price. If he has some capital to work upon he can be independent of everyone. Capital, however, is of no use without knowledge of how to conduct the business in which it is employed, and knowledge must be backed up with energy, sustained by perseverance in carrying the work continuously to its completion. There is a lot of land in this neighborhood which ought never to have been taken up for wheat-growing, because it is not suitable; but there is where the want of knowledge was evidenced. There is also a lot of good land in the locality, but much of this is not put to its best uses. Weeds, dead timber, rubbish, and vermin are the chief features on some of it; and, in a few instances, small plots of splendid vegetables and fruit are grown where much larger areas of these suitable products ought to be cultivated. If it is found that wheat-growing will not pay, although the soil is rich and fertile, most probably other products, such as butter, cheese, bacon, poultry, eggs, &c., would be found profitable, if produced on a sufficiently large scale. To properly maintain the full number of cows on a dairy farm, it is imperative that a large quantity of fodder must be grown for their sustenance at times when natural herbage is liable to become deficient.

Ensilage must also be practised and stacks of hay provided. The varied and skilled labor involved in such a system of farming will be so interesting to the young people that they will feel but little desire to find more agreeable employment elsewhere. The cause of failure with a very great number of so-called "farmers" is due, not so much to bad seasons, droughts, &c., as to the fact that in the first place they had no knowledge whatever of farming. They were clerks, tradesmen, artisans, and the like, who took to farming because they could obtain no employment in their proper avocations. They have been used to real hard work, and possessed energy and perseverance, but they want a knowledge of what is necessary in their new pursuit. Some of them have since gained that knowledge and have established very nice homes and good farms, whilst others have failed. In some cases the children have not followed in the footsteps of their parents. Many have left the farm to enter upon other occupations, and several of those who have remained at home have not progressed in knowledge of farm work, or in actual learning, and, as a consequence, their progress has been anything but successful.

Scales Bay, September 29.

Present—Messrs. E. R. Aitchison (chair), W. J. Thomas, G. H. Newbold, A. Newbold (Hon Sec.), and three visitors.

CATERPILLAR PLAGUE.—Caterpillars have disappeared after injuring many of late-sown crops so seriously that they are not worth reaping. The early crops were also injured. [The caterpillars have developed into moths, which will deposit myriads of eggs, from which other caterpillars will be produced.—GEN. SEC.]

Naracoorte, September 8.

Present—Messrs. S. Schinckel (chair), A. Johnstone, J. Wynes, H. Buck, and E. C. Bates.

TOBACCO TREES AS SHELTER BELTS.—The Conservator of Forests wrote that Mr. Johnstone was incorrect in stating he had advised planting the tree tobacco (*Nicotiana glauca*) as a shelter tree, as he had never made such a recommendation. Mr. Johnstone said he regretted having made a mistake, but he had a strong impression that he had seen the recommendation attributed to the Conservator in a newspaper. Personally he was surprised, but had supposed it to refer to the cold bleak plains where it was difficult to grow trees without some shelter.

CONGRESS.—Mr. Bates was empowered to bring before Congress the question of putting a stop to the practice of mixing header or straw chaff with hay chaff, and also the advisableness of the Government storing and selling fertilisers to ensure that they were not adulterated. Several members objected to the Government taking any part in the sale of fertilisers. [Both matters are dealt with in the Congress report in October issue.—GEN. SEC.]

GORSE AS A FODDER PLANT.—Mr. Wynes doubted whether the plant used as fodder in New Zealand was the same as that known as gorse, or furze, in several parts of South Australia. The latter was regarded as a nasty weed, both here and in England. Mr. Wardle was obtaining seed from New Zealand for the purpose of sowing alongside the local seeds. It was decided to write to the New Zealand Department of Agriculture on the matter. [The gorse, or furze, or whin of New Zealand, is the same as that so known in South Australia.—GEN. SEC.]

SEED EXPERIMENTS.—The Chairman reported favorably on seeds received from Central Bureau as follows:—Dart's Imperial Wheat, very good, largely grown now in the district; Mammoth Chili Squash, and Giant Pera Cucumber, both very good but failed to produce seed; Yellow Leviathan Mangold, very good, but failed the second year. Numerous other varieties tried had proved failures. Other members reported similar results. Messrs. Bates and Wynes

reported favorably of Purple Giant kohlrabi. Mr. Johnstone said trials with Central Bureau seeds generally do not go beyond the first stage. They required to know whether the varieties were suitable for the district, and small tests in the garden were not sufficient. If they extended their operations with the seeds they would know whether certain plants were suitable for the district. The Chairman tabled a number of packets of seeds for distribution.

STANDARD SAMPLE OF WHEAT.—This matter was referred to, and the opinion expressed that some alteration was necessary, but nothing definite was done.

Appila-Yarrowie, September 21.

Present—Messrs. P. Lawson (chair), C. Keller, C. Hirsch, J. Wilsdon. A. Fox, J. Bottrall, E. Catford, W. Francis, C. G. F. Bauer (Hon. Sec.).

HOMESTEAD MEETING.—This meeting was holden at the homestead of Mr. Catford. The dwelling-house and all the farm buildings are very substantial, and are roofed with galvanized corrugated iron. The garden is watered with the overflow from a large excavated reservoir. Some of the fruit trees are badly diseased, but the orange trees are very healthy and loaded with fine fruit.

PRESENTATION.—At a liberally supplied luncheon Mr. Lawson, on behalf of the Branch, presented the Hon. Secretary (Mr. C. G. F. Bauer) with a handsome marble clock in appreciation of his zealous services as Hon. Secretary since the inauguration of the Branch ten years ago, during which time only three of the original members have resigned. Several members spoke in eulogistic terms of Mr. Bauer's good qualities, both as Hon. Secretary and as a good neighbor. [Mr. Bauer, with characteristic modesty, thanked the members for their appreciation of his efforts, which had been so well supported by themselves.—GEN. SEC.] Thanks to Mr. and Mrs. Catford closed proceedings.

Pine Forest, September 7.

Present—Messrs. R. Barr (chair), G. Inkster, W. C. Cooper, W. H. Jettner, F. Masters (Hon. Sec.), and one visitor.

COMBINED BRANCHES' SHOW.—Delegates reported that they had attended a meeting *re* combined show, when it had been decided to postpone the show on account of lateness in making preparations, and the Branch was requested to reconsider the question of extending and enlarging the operations of the society and run it as an agricultural society. Mr. Masters was surprised to hear that it was thrown over again this year on such a flimsy pretext, and he proceeded to utter some severe strictures on the want of attention to this business shown by someone who has been paid to attend to this matter. Mr. Jettner supported his remarks, and it was resolved—"That this Branch is opposed to the extension and enlargement of the Port Broughton Show as suggested."

STANDARD BUSHEL.—Mr. Masters then read some remarks from the *Garden and Field* upon the Conference with the corn trade section of the Chamber of Commerce, and, after some discussion, it was resolved—"That this Branch views the result of the Conference with dissatisfaction, and expresses surprise at the inconsistency of Messrs. Molineux and Gleeson in refraining to vote on the question, and fails to see how those delegates can reconcile their action with their previous utterances, which [action] certainly lost the day for the farmers." [When Mr. Darling had declared distinctly that he would *not* be bound by any decision altering the present system, and whilst that resolve

seemed to be generally supported by the wheatbuyers there present, it would have only injured the wheatgrowers had we voted on the question. The two votes would have placed the responsibility of a casting vote on the Chairman, and he was not favorable to a change. But, even if the proposal for a fixed standard had been carried by a majority of one, the position would have been still the same—the wheatbuyers would refuse to deal except on the old system, and the farmers are not yet sufficiently combined to take the matter into their own hands. — GEN. SEC.]

Lucindale, October 6.

Present—Messrs. E. Feuerherdt (chair), J. C. Newman, James Riddoch, A. Dow, A. Matheson, E. Hall, George Humphries, E. E. Dutton (Hon. Sec.), and one visitor.

SEED EXPERIMENTS.—Reports on seeds received from Central Bureau, sown September 11, 1899:—Cocozelle marrow, medium size, good quality, keeps well; Long Green marrow, good keeper, shy bearer; Early Golden Bush marrow, fair size, good keeper; Purple Giant and White Goliath kohlrabi, both too small, and took a year to grow. Tomatoes planted August 23, 1899—Helios, King Humbert, and Semperfructifera, all small and late, heavy bearer, not worthy of special mention, season unfavorable. [King Humbert is a very prolific variety, good flavor, medium size, and brilliant yellow color.— GEN. SEC.]

Morphett Vale, October 3.

Present—Messrs. L. F. Christie (chair), J. Bain, H. Anderson, T. Anderson, F. Pocock, E. Perry, F. Hutchinson, J. Depledge, A. Pocock, A. Ross-Reid (Hon. Sec.), and two visitors.

EXHIBITS.—By Mr. Hutchinson—Some very fine beans, and two samples of Swedes grown after peas which had been manured with superphosphate. Those sown in April were better than those sown in May. Mr. Christie tabled samples of wheat, showing the benefit of manuring with super. Where 150lbs. per acre had been applied the crop would be fully four times heavier than where none was used. Mr. H. Smith (visitor) said White Tuscan is the best wheat for hay.

BINDER TWINE.—Mr. Ross-Reid said the vigneroners were purchasing waste binder twine from sheaved hay at 2½d. per lb., provided it is cut close to the knot.

EXPORT LAMBS.—The Hon. Secretary read a paper on “Lambs for Export,” to the following effect:—

Breeding lambs for England is now an established business. In 1896 lambs were sold in Adelaide at 5s. each, but now they are worth 8s. 6d. to 9s., as a result of the frozen export trade. When once a farmer has kept sheep he never departs from the practice. It is not wise in this district to have lambs come in too early. The Lower North farmers can get them in earlier than we can, and they secure the good prices that then prevail. At this time there is but little grass, but in July there is much more, and the land will carry more stock. Ewes and lambs should have a change of feed once a week, if possible. This is important. Divide the farm in o numerous small paddocks, and keep the sheep in small flocks. In this district 100 lambs and ewes is enough in one flock. In cold wet weather put the lambing ewes in a sheltered paddock. Do not put ewes about to lamb on thick succulent feed, as they are more liable to bloat than empty sheep. In this locality the Lincoln cross-bred does better than the pure Merino, but they require better fences. The ram must be a very good one, though not necessarily a prizetaker. The quality of wool does not matter much, so long as it is close, as the lambs with close wool look more taking to the buyer. The Shropshire is pre-eminently the ram to use for the export lamb trade. Get a good two-tooth ram large, bulky, straight

in the back, short in the legs, deep and wide through the heart, with a tight, thick fleece, and appearance of a generally good dress. One ram in good condition is sufficient for a flock of eighty ewes. It is a good idea to change rams for a month with a neighbor; or else buy a good lamb ram and turn him in with the flock towards the end of the season. Look well after the sheep, and they will pay for the trouble. Send the lambs in when they will weigh 38lbs. to 40lbs. dressed.

EXPORT BUTTER.—Members are not satisfied with the present system in selling small lots of butter. They would be pleased to have a co-operative packing establishment in Adelaide to ship the butter to England. It was resolved to invite a lecturer from the Farmers' Co-operative Union.

Mount Remarkable, October 4.

Present—Messrs. A. Mitchell (chair), G. Yates, W. Lange, C. E. Jorgensen, T. P. Yates, D. Roper, and J. McIntosh.

CONGRESS.—Delegates to Congress of Bureau in Adelaide reported on proceedings; also upon visits to Agricultural College and Islington workshops. They considered the whole to be most instructive and interesting. Thanks accorded.

Millicent, October 4.

Present—Messrs. H. F. Holzgrefe (chair), H. A. Stewart, G. Mutton, H. Warland, H. Hart, H. Oberlander, R. Campbell, and E. J. Harris (Hon. Sec.).

RED SPIDER.—Mr. Oberlander tabled branches of plum and peach trees attacked by *Tetranychus tellarius* (red spider), a microscopic mite which becomes very numerous on the leaves of fruit trees and many other plants. They spin a very fine web under which the mites live upon the sap. They are both mandibulate and haustellate, that is, they gnaw into the substance of the leaf with their jaws, and then suck out the juices with their sucking apparatus. Their excreta is retained beneath the fine web and also acts injuriously on the leaves. Mr. George Quinn, Horticultural Instructor, had been consulted, and recommended use of salt, sulphur, and lime mixture whilst the leaves are off the trees, but when in leaf the best remedy would be a forcible spray with kerosene emulsion, and the next best thing is sprinkling with flowers of sulphur.

JERSEY KALE.—Mr. Holzgrefe said he had grown thirty-six acres of Jersey tree kale, which made good feed, but now he was troubled to get rid of the stumps. Mr. Hart said it would be best to sow grass seeds early and let the sheep trample the stumps down. The stumps would be gone within two years.

CO-OPERATIVE EXPERIMENTS.—Mr. Campbell would like to see the General Secretary's recommendation adopted. Let one or more members conduct the experiments with manures and seeds, and the others provide the material. In some other localities remarkable results had followed carefully-conducted experiments with manures and proper cultivation. He thought there was ample scope for improvement in potato cultivation in the district.

APPLE-GROWING IN THE SOUTH-EAST.—Mr. R. Campbell read a paper on the above subject, from which are gleaned the following points :—

The export to England being established, and a footing gained in continental, South African, and other oversea markets, the outlet for good apples seems assured. Although maturing too late to catch the early markets, and slightly handicapped with extra freights, the consignments sent from Coonawarra had given good returns. Notwithstanding the arrival in an overripe condition of several cargoes last year, those sent through the S.A. Depot averaged 13s. 6d. per case in London. The apples which were sent from the South-East to South Africa during the past season returned very profitable amounts; in some instances growers netted 13s. 6d. per case. Throughout the South-East there are station and other orchards in which, with ordinary care and shelter, splendid apples are grown. Pretty well every visitor, whose experience entitles him to judge, declares the fruits produced in the

South-East are unsurpassed. The question of over-production need not prevent persons planting, for although England alone imports from three to six millions of bushels of apples annually from America, these did not come into serious competition with the apples from Australia, because they ceased to arrive before ours reached London. South Australian apples had topped the markets, and he thought this largely due to the efforts of the officers of the Agricultural Department instructing them as to what to send and how to send it. He advocated restricting the varieties in the orchard to about half a dozen kinds, but as all good kinds will not thrive in every locality, and only test will prove which will suit, a few more sorts might be put in, as the unsuitable kinds can readily be regrafted to desirable kinds. Fruit-growing is a healthful and honest occupation, and can, with the exception of the rougher work, be followed by both sexes. It should be made auxiliary to other industries. Pigs, poultry, and sheep would work in conjunction with it if sufficient land were held. In any case poultry-keeping would be a profitable adjunct if enough land only for an orchard was available, as it has been found in America that where such is done it considerably increases the yield. In one instance recorded, a prime orchard, divided in two parts, and fowls kept on one and not on the other, the former gave double the crop. It is an industry that can overlap into succeeding generations without the trouble or expense of replanting, and does not exhaust the soil like other crops, though certainly much better yields are assured by rational manuring. Once established, except for odd trees, replenishing is not necessary for many years, and children's children would, in many cases, enjoy the produce. Fruit-growing would keep the family on the farm till they married and moved off to a home of their own, and then they could be spared a share of the fruit till their own trees came into bearing. With all these facts and arguments it appears about the best business out, and no young man starting to make a home for himself should neglect even for one season to plant fruit trees—"They'll be growing while he's sleeping."

Norton's Summit, October 6.

Present—Messrs. J. Jennings (chair), J. Pellew, H. Hcrsnell, John Hank, and W. H. Osborn (Hon. Sec.).

FRUIT PROSPECTS.—There is a failure in apricots and peaches. The curl-leaf in peaches is bad, and several growers fear that *Fusicladium* (scab) will be prevalent on apple and pear trees. Some are spraying to prevent damage. [To prevent injury from *Fusicladium* and curl-leaf it is necessary to thoroughly spray the trees with winter strength of Bordeaux mixture when the buds begin to open, and repeat if rain should fall soon after.—GEN. SEC.]

Nantawarra, October 3.

Present—Messrs. Jas. Nicholls (chair), J. W. Dall, S. Sleep, H. J. Spencer, R. Uppill, A. E. Herbert, E. J. Herbert, E. J. Pridham, and T. Dixon, jun. (Hon. Sec.).

EXHIBIT.—Mr. Hocking forwarded sample of cotton grown in Western Australia.

CONGRESS.—Mr. Dall, as delegate, reported on his attendance at the Twelfth Annual Congress of the Agricultural Bureau held in Adelaide last month. He considered it the best of the eleven that he had taken part in, and was sure it would result in good. The visit to Islington Locomotive Workshops was surprising and instructive. He also visited the Agricultural College, and noted the very beneficial effect upon grasses caused by fertilisers applied to previous crops. A crop of oats there appeared to be rather too thickly sown, according to his ideas, and he thought if there had been less seed put in the straw would have been stronger and better able to stand up against heavy winds, should such occur.

TAKKALL.—Mr. Spencer tabled sample of wheat affected by what he called "takeall." Mr. Sleep did not think takeall is due to the land being dry and hollow, because he had noticed the disease where the ground was particularly solid. Mr. Pridham did not think it was due to dry working, but most of the members agreed that takeall is most prevalent where the land is worked dry.

Rhine Villa, October 6.

Present—Messrs. A. Payne (chair), H. Payne, H. Modistach, W. Farey, J. Vigar, and G. Schick (Hon. Sec.), and visitors.

EXHIBIT.—By Hon. Secretary—Skinless pea, very prolific and profitable to grow for cooking or for pickling.

RABBITS.—Chairman said he had seen hundreds of rabbits caught in an enclosure of wire-netting erected in star-like shape around attractive vegetation. Trap-doors were affixed in each inside corner, where the rabbits could enter.

“**HOW TO FARM SUCCESSFULLY ON THE MURRAY FLATS.**”—Mr. W. Farey read a paper to the following effect:—

Owing to variation of rainfall and other conditions in different parts of Murray Flats the country might be divided into three sections, viz.—from the range to a distance of two and a half miles eastward; then another belt eastward two and a half miles wide; and thence still eastward to the Murray river. In the first division he considered the land worth no more than 30s. per acre, and no farm should comprise less than 1,000 acres, divided into five or six paddocks. Of this 200 acres should be perpetually maintained in their natural grasses, &c., and this should be near the homestead. The rest of the land should be cropped only once during three years; fallowed during the June and July precedent to sowing for crop. The land should also be manured when both the crop and the stock which graze afterwards on the land will be benefited. Pigs of a good breed should be kept, and green feed grown as much as possible for all stock, especially cows. Fowls will thrive here, as there is but little frost, and sheep will be found profitable in keeping down weeds, as well as for wool, lambs, and mutton. Fruit will not pay to grow, but in winter vegetables can and should be grown for home use. Ducks, geese, and turkeys will not thrive as well here as in the hilly country, as they need green grass all the year through. More of the wheat and hay that is grown should be kept in reserve for dry seasons, as it is a great disadvantage to have to buy back and cart it over the range in dry seasons for ourselves and our stock. The area between two and a half and five miles from range eastward has much less rainfall, though the soil is equal in quality. Its improved value is not more than £1 to 30s. per acre, and its rental should not be over 1s. to 1s. 6d. per acre. Farms should not be less than 2,000 acres, contiguous, so that it can be worked economically from the home. This country is not well adapted for growing cereals, but sheep, cows, pigs and fowls can be reared profitably if good care is taken to provide during the seasons of plenty against periods of scarcity. A most important item is the storing of water. The soil is good for making reservoirs or dams, and there ought to be one of good capacity in each paddock. A well should be sunk near to the homestead. At present there is more labor entailed in carting water on to the land than is expended in carrying produce off, and this is useless and costly both to the individual and to the district council. The aggregate of loss in wear and tear of vehicles, harness, horses, men, and roads must be very great in the case of water carting. In the third class, commencing five miles eastward of the range to the river banks, the rainfall is still less. The farms should consist of not less than 3,000 acres in one block, and when cleared it is not worth more than 5s. to 7s. 6d. per acre. This country is adapted chiefly for sheep; and cows, pigs, and fowls should only be kept for home use. No reliance can be placed on wheat crops, as thirty years' experience has shown that only once in five to seven years is there a chance of a crop being produced. Most of the country is too stony. If wheat is tried it must be only once during three years on any one spot, and the bushes must be destroyed. Farmers should be able to live in comfort on their land, even though it is poor, but should not sell everything off it and return nothing, as many do. They should live on the produce of their land, and be able to procure requisites that they cannot produce, and should not work sixteen, fourteen, or even eight hours a day. He should have plenty of leisure for improving his mind, and make a proper use of all the rights and privileges which Providence always designed for all men.

The Chairman said the greatest mistake lies in not storing fodder for stock. Even chaff and straw would be better than nothing. Fallowing on the flats was also necessary, as the loosened soil lets in the rain and acts as a mulch to prevent its evaporation.

Swan Reach, October 6.

Present—Messrs. J. L. Baker (chair), P. F. Hassé, L. Fidge, W. Hecker, O. Halliger (Hon. Sec.), and three visitors.

EXHIBIT.—Mr. J. L. Baker tabled some excellent Telephone peas, grown without irrigation. [Was there any business in addition to this?—GEN. SEC.]

Gumeracha, October 8.

Present—Messrs. D. Hanna (chair), W. A. Lee, A. E. Lee, W. V. Bond, W. Hannaford, and T. W. Martin (Hon. Sec.).

"EXTENSION OF FRUIT CULTURE."—Mr. W. V. Bond read a paper to the following effect:—

We often hear it said that fruit-growing is overdone, and it is useless to plant more fruit trees, but others are ready to plant a few more acres with trees. In our district there are hundreds of acres that will return a better profit from fruit cultivation than from anything else. I have no hesitation in saying that no other place in the world is more highly favored and can produce a greater variety and abundance of fruit all the year through. Growers of fruit have generally profit in view. Then the question arises does fruit growing pay, and will it pay in the future? The larger the quantities grown the more profitable the pursuit will prove, provided good judgment is used in the selection of varieties and site of plantation. New markets are being opened up, export trade becoming established, and many ways of utilising our surplus stock. There need be no fear of fruit-growing being overdone. There may be seasons when prices will be low, but we find it the same with all other produce; yet there is no fruit which comes so near to being a staple commodity as the apple, and none which has a longer market season or can be manufactured into a greater number of products. The apple and the plum grower is not dependent upon a single outlet for his crop. In selecting a piece of land for apple-growing, the drainage should be good, and the site should be sheltered from heavy rough winds and where the early morning sun can shine on it. The low wet soils make excellent pear and plum lands. There are many different kinds of apple, but it is well not to grow too many varieties, as a few well-known, proved good keepers suitable for export trade and the local market would pay much better than trying to grow a lot of fancy sorts, many of which would turn out failures. The plum is a fruit that will pay to grow more extensively in the hills district. They are largely used for jam-making, canning, and drying. Anyone can rear a stock of plums at little cost by putting in cuttings of the American plum to root and grafting them the following year. By so doing no suckers will be thrown up, which are such a drain upon the trees grafted upon common suckers. The following are some of the best kinds to plant:—River's Prolific, Coe's Golden Drop, Monfries' Golden Drop, Greengage, French Prune, Kirke, Yellow Magnum Bonum, and Claude de Bavay. The plum will grow well on the low wet lands, and sodden soil does not injure the roots as it does the apple; a greater number can be planted to the acre, they are much quicker coming into bearing, and do not require so much spraying and pruning as the apple, and as plums are picked and taken away directly to the market there is no loss or waste and a quicker return for the grower. There is a great future before us as fruitgrowers, and our resources are immense. The trees we plant go to enrich the world, and our children will receive the benefit of our labor spent in tree-planting for very many years to come.

Mundoora, October 5.

Present—Messrs. W. Aitchison (chair), J. J. Vanstone, W. J. Shearer, T. Watt, J. Loveridge, C. H. Burton, and A. E. Gardiner (Hon. Sec.).

"THREE-CORNERED JACK."—Mr. Shearer tabled a large plant of this (*Emex australis*). It is becoming a pest, produces a multitude of seeds, which stick to the legs of horses, cattle, and the wool of sheep, and is thus spread all over the country. Members agreed that it must be eradicated at once.

EXHIBIT.—Mr. Aitchison tabled some very fine carrots, each measuring 11½ in. in length and 7 in. circumference, with no forks or side roots, grown in sandy loam with a little English super.

TAKEALL.—This disease is showing in several wheat crops. One farmer had taken much care to thoroughly work his fallow last season, and still it was attacked.

PROLIFIC STEINWEDEL WHEAT.—Mr. Shearer stated that a plant of Steinwedel, produced from a single grain, grown on an old sheep camp, had sixty heads with 60 grains in each head, or 3,600 grains from a single seed. As Steinwedel is a variety that does not stool to any extent the sample was considered to be extraordinary, notwithstanding the favorable circumstances under which it was grown.

Murray Bridge, October 10.

Present—Messrs. W. G. Hannaford (chair.), J. Stacker, A. G. Kutzer, R. Edwards, W. Lehmann (Hon. Sec.), and one visitor.

WEEDS.—Mr. R. Edwards tabled sample of weeds which are becoming rather plentiful in crops of cereals, and wished to learn whether they would be injurious to stock. [The plants are commonly known as charlock (*Sinapis arvensis*). Another plant, known as “jointed charlock” (*Raphanus Rapanistrum*), is, I believe, a pest in Western Australia, under the local name of “Spanish radish.” Both plants are extremely undesirable pests on arable lands, and when their seeds are allowed to ripen the land should only be scarified, to give every seed a chance to germinate, so that the young plants can be ploughed under before they flower. If the seeds are ploughed under 3in. or 4in. they will remain good for very many years, and will grow when brought near to the surface by subsequent cultivation. Both *Sinapis* and *Raphanus* are very closely allied to Brassica, and all are useful as food for live stock, but many of the varieties are liable to impart an offensive taste and odor to milk of cows fed upon the leaves.—GEN. SEC.]

MANITOBA WHEAT.—Mr. Stacker read the following from the *Australasian*, and thought members should endeavor to secure some seed:—

The marked disparity between the price of local-grown wheat and the hard milling variety imported from Manitoba points to the conclusion that our farmers ought to give the subject of improving the wheats of this colony greater attention than they have hitherto done. Sydney bakers freely give £3 and upwards more per ton for Manitoba flour than for the Australian-grown article, and while certain attempts to introduce the hard American wheat to this colony have been only partially successful, certain other experiments have proved eminently successful. Mr. James Amos discusses this question in a letter to the *Sydney Morning Herald*, stating:—“This morning we tested a sample of Manitoba flour—the wheat grown and manufactured in New South Wales. It contains 17 per cent. gluten, and is a very granular flour; 50 per cent. semolina. The bread baked by a Sydney baker is equal to that from Manitoba flour (imported), and in confirmation of the quality a certain baker has purchased the whole parcel at £9 per ton in preference to the usual New South Wales flour at £6 per ton. This information should encourage New South Wales farmers and millers to cultivate and manufacture Manitoba wheat.” No information is furnished respecting the locality where this wheat was grown by Mr. Amos, but similar satisfactory results were noted in this column last year regarding Manitoba wheats grown in the Armidale and Goulburn districts. There appears to be some doubt, however, about the wheat retaining its glutenous qualities after being grown for several seasons in this colony. Experiments conducted in this direction in South Australia go to show that after the third or fourth year the Manitoba wheat loses its distinctive features, and for milling purposes degenerates to the level of common Purple Straw. Whether this arises from the nature of the soil and climate, or is due to cross-fertilisation, no one seems able to explain. The variety of wheat in question is believed by some authorities never to have been imported into this colony, but, however this may be, it is strange that even in America it has never been grown successfully outside the boundaries of Manitoba and the north-western States. Perhaps if a trial were made on virgin soil in the western districts of New South Wales, where the wheat could be kept pure and free from contact with all other varieties, it might possibly succeed as well here as it does in Manitoba. At any rate, there is here a wide field for investigation, and the farmer who first produces the desired quality of wheat would doubtless be well rewarded for his enterprise.

Hawker, October 3.

Present—Messrs. S. Irvine (chair), J. W. Schuppan, H. M. Borgas, R. Wardle, A. C. Hirsch, Jas. O'Loughlin, and J. Smith (Hon. Sec.).

RABBIT-POISONING.—The chairman said he had tried nearly everything recommended for poisoning rabbits with varying success. Bisulphide of carbon was not always reliable. He had used over a gallon, and had found living rabbits as well as dead ones in the burrows at the same time after use. Wheat poisoned with strychnine, or even arsenic, would probably be very effective if

all farmers would act in concert; but it is useless for only one or two to attempt to exterminate them. The law for compelling people to do this was very badly administered. Mr. Hirsch had purchased stuff purporting to be strychnine, but had given some to cats, which seemed to grow more healthy upon it. [Get Blundell's strychnine in original packages.—GEN. SEC.] Bisulphide ought to be put in the burrows two or three times, as once only was of little use. The Hon. Secretary had killed seven head of cattle with phosphorus and pollard baits laid for the destruction of rabbits, but had been very successful with wheat poisoned with arsenic and also with strychnine, which did not injure the cattle. He thought a piece of woollen saturated with bisulphide and tied on to a live rabbit allowed to run into the burrow would be effectual. With poisoned baits it is best to run a shallow furrow and lay the baits in it. Baits laid about 4in. from the "buck-heaps" or "squats" would kill a good many. Concerted action is necessary, and the law should be more stringently administered; but he did not like the idea of compelling one neighbor to inform against another.

EXPERIMENTS.—Members visited Mr. Borgas's experimental plots. Owing to the dryness of the soil none of the wheats were doing well, but it was noted that the manured plots were the best.

LOCUSTS.—The young locusts are eating everything before them. The "Three-cornered jack" (*Emex australis*) is believed to be poisonous to them, as many dead locusts are found near to each plant.

PROSPECTS.—The season has been so dry that it is doubtful whether the seed that has been sown will be recovered in this district.

Auburn, October 4.

Present—Messrs. G. R. Lambert (chair), J. E. Isaacson, J. Hean, and J. W. Yeatman (Hon. Sec.).

PRUNING PEACH TREES.—The Hon. Secretary said spur and rod pruning of peach trees had answered well with him.

VINES.—Vines are flowering freely, and there is promise of a good crop this year.

Golden Grove, October 4.

Present—Messrs. R. Smart (chair), J. Ross, J. Anderson, A. Harper, W. Mountstephen, J. Woodhead, A. Robinson, S. A. Milne, F. Buder, and J. R. Coles (Hon. Sec.).

THE AGRICULTURAL COLLEGE.—Members are all agreed that this is a splendid institution, calculated to improve the farming generally throughout the colony.

Narridy, October 6.

Present—Messrs. A. McDonald (chair), J. Liddle, R. Satchell, H. Nicholls, Jas. Darley, E. Smart, J. Nicholson, D. Creedon, A. Hiskey, Thos. Dunsford (Hon. Sec.), and six visitors.

CONGRESS.—In reporting upon their visit to the Twelfth Annual Congress of the Bureau in Adelaide (amongst other matters), the delegates alluded especially to Mr. R. Marshall's paper. Mr. Nicholls said Mr. Marshall had taken up a lot of land that had been worked out by previous occupiers, and by his good cultivation had restored it to fertility. His system of sowing the manures in autumn, when the soil is dry and easy for the teams to work upon, would

doubtlessly expedite and lighten the work of sowing later on, as the land could then be worked by all the strength of the teams, instead of a portion of them being employed in the drills. With regard to hay he thought that solid-strawed wheats would make good hay when clean and well harvested, but he would like to know which is the best to mix with self-sown hay—salt or molasses—to make it palatable for horses. *Re* fertilisers he considered the vendor should be held responsible for any deficiency in the constituents. [The Act provides that the vendor must give, with every parcel of manure sold, a certificate, stating the quantities of phosphoric acid, potash, and nitrogen, with a number of other details. That certificate is a guarantee, and if it is found to be incorrect of course the vendor is responsible and liable to damages sustained by the purchaser.—GEN. SEC.]

Golden Grove, October 15.

Present—Messrs. S. A. Milne (chair), A. Harper, J. Ross, R. Smith, A. Robinson, J. Woodhead, F. Buder, J. R. Coles (Hon. Sec.), and three visitors.

VISIT TO ROSEWORTHY AGRICULTURAL COLLEGE.—By arrangement the members were met at Gawler by a drag and conveyed to the College. Professor Lowrie showed them plots of King's wheat treated with thirty-one varieties and mixtures of fertilisers; the plot on which 2cwts. of English superphosphate per acre was used is at present looking the best. Then he showed a number of plots sown with different varieties of wheats all sown under one treatment. The first series of experiments were to illustrate the effects of various manures, separately and mixed, on a particular variety of wheat. The other showed the adaptability of various wheats to the particular circumstances of the locality, but all treated alike. Some (if not all) of the seed had been treated against bunt by steeping for ten minutes in water at a temperature strictly maintained between 132° F. and 135° F. A plot of 100 acres of Calcutta oats was very much admired, and one of the members determined to secure some seed, if possible, for next season. Some of the members favorably criticised half a dozen of the unbroken horses. They also inspected some very good dairy cows. The farm is poorly adapted for fruit-growing, as the trees cannot make vigorous growth. The wine cellars and the vineyard were thought to be well kept. Several other interesting objects were inspected, and the Professor was heartily thanked for the instruction imparted during this visit.

Boothby, October 9.

Present—Messrs. H. S. Robinson (chair), T. B. Robinson, R. M. B. Whyte, J. A. Foulds, T. Sims, G. T. Way, H. G. Evans, R. Carn (Hon. Sec.), and one visitor.

LOCUSTS.—Members wish to learn how to destroy locusts wholesale, or at least to check their advance. [This information has already been published in our *Journal of Agriculture* for October, 1898, page 276; also for March, 1898, page 649; and for June, 1898, page 882. Dissolve 16ozs. washing soda in 1gall. boiling water; in this dissolve 8ozs. white arsenic; then stir in 4lbs. brown sugar, and add 4galls. more water. Mix with this as much nice green chaff, or finely-chaffed green stuff as will absorb all the liquid, and scatter handfuls wherever the young locusts are gathered. They will crowd to the food from a radius of 50yds. The locusts eat their poisoned comrades, and they also die.—GEN. SEC.]

APPLYING MANURES.—Members are of opinion that, for small areas, just as good results will be secured by broadcasting manures as by drilling, and

thus the cost of the drill can be saved by the small farmer. [If members have proved the case by several experiments this opinion should carry much weight. The advocates of drilling in such small quantities of super. as 100lbs. per acre along with the seed contend that by placing the fertiliser in close proximity to the seed the wheat gets a rapid start, while the weeds between the drills are starved, and the wheat plant smothers them. Of course, if the manure is thrown broadcast the weeds stand an equal chance with the cereals, and will in many cases injure the crop. If manures are broadcasted it will be necessary to put in 2cwts. per acre at least.—GEN. SEC.]

PIGS.—Mr. Carn said some of his pigs lost their appetite, then the lower part of their legs became paralysed. Mr. Evans advised him to mix wood ashes with their food.

VERMIN.—Members consider use of dogs and filling in of burrows is the best way to exterminate rabbits. They think phosphorised pollard is too dangerous to live stock. [Undoubtedly this is the case with regard to the poisoning of live stock and myriads of useful birds. The objection does not apply to strychnine, sugar, and sandalwood twigs. Wire-netting and pounds or traps in the boundaries are effectual.—GEN. SEC.]

Lyndoch, October 11.

Present—Messrs. H. Kennedy (chair), W. J. Rushall, M. Burge, A. Springbett, H. Springbett, P. Zimmermann, B. Reu, R. Loveridge, and J. Mitchell (Hon. Sec.).

BULLS—Members are of opinion that the dairy stock in this district are suitable for all dairy purposes, and they are not in favor of purchasing a pure-bred dairy bull with a subsidy of £1 for each £1 raised by subscription for that purpose.

SEEDS.—Owing chiefly to the unfavorable seasons very few of the seeds sent by Central Bureau have given any good results. One good variety of water-melon, shewn by Mr. W. Rushall, had been grown, and Mr. A. Springbett had two good sorts of lettuce.

Colton, October 6.

Present—Messrs. P. P. Kenny (chair), W. J. Packer, M. S. W. Kenny, John Shipard, B. A. McCaffery, E. Whitehead, and Robert Hull (Hon. Sec.).

CONGRESS.—The Hon. Secretary reported on his visit to the Annual Congress of the Agricultural Bureau in Adelaide last month. He was not very favorably impressed with what he saw, but thought it was a difficult matter to keep order in such large gatherings. Everyone was full up with information which he was eager to impart to the rest.

Hahndorf, October 13.

Present—Messrs. T. H. Sonnemann (chair), C. Bom, C. Jaensch, Thos. Grivell, H. Spoehr, J. C. Rundle, D. J. Byard (Hon. Sec.), and several visitors.

At the invitation of the Branch, Mr. R. Caldwell, M.P., attended, and delivered a very instructive lecture, entitled "An Hour's Chat about Central Australia." The lecturer, who is well qualified to speak on the subject, both by his own experience and his acquired knowledge, held the attention of his hearers by his chatty reminiscences, and made his meaning clear by maps and diagrams. After briefly describing the physical characteristics of the central

part of Australia, he spoke of the difficulties which stood in the way of its development—its long droughts, followed by devastating floods; its furious winds, and terrible dust storms. The principle of artesian wells and springs was clearly explained, and it was shown how the enormous rainfall on the coastal ranges of Northern Queensland supplied this natural reservoir, the water travelling hundreds of miles under a thick bed of shale, and, being tapped at various depths, rising to the surface sometimes at a temperature close upon boiling point. The properties of artesian water were touched upon, and it was pointed out that, while stock thrived upon it, for purposes of irrigation it was of little use. The importance of developing the mineral resources of the country was insisted upon, the more so as the Transcontinental railway might soon follow the accomplishment of Federation. Questioned as to the fitness of this region for agriculture, the lecturer replied that in favorable localities it would be possible, as water could be cheaply conserved; but horse and cattle breeding could be successfully carried on. A vote of thanks to Mr. Caldwell was carried.

Mount Compass, October 13.

Present—Messrs. M. Jacobs (chair), R. Peters, S. Arthur, F. McKinlay, R. Cameron, and A. J. Hancock (Hon. Sec.).

SEASONABLE OPERATIONS.—Plant potatoes; sow turnips, cabbage family, all melons, squashes, cucumbers, &c.; transplant onions and tomatoes.

SUGAR GUMS.—Mr. Jacobs reported that grubs were attacking his sugar gums planted last year. [Two leaves were sent to me, each with a cocoon on, from which the caterpillar—not “grub”—had escaped. How is it possible to identify a thing of that kind?—GEN. SEC.]

FIELD POPPY.—Mr. S. Arthur said the field poppy had been introduced somehow on his land.

PEACH LEAF-CURL.—Mr. F. McKinlay reported excellent results from spraying his peach trees with Bordeaux mixture for prevention of curl-leaf. He used 1lb. lime, 1lb. bluestone, and 5galls. water. [Presumably when the buds are first commenced to burst open?—GEN. SEC.]

“CHICKENS.”—Mr. J. Jenken submitted a paper on this subject. The following is a short condensation:—

The first thing is to select sittings of eggs from good, sound, strong, healthy birds. Put them under quiet old hens, as they are not very liable to leave the nest, and make better mothers generally than young hens. Make all nests on the ground, which should be moistened if very dry, else the dry soil will abstract moisture from the eggs. After five days remove all infertile eggs. If there are several hens that have been sitting for the same number of days, their clutch can be made up by removing one and dividing her clutch amongst the rest. If the chicks are backward in breaking out of their shells at the proper time, the eggs may be placed in warm water for a very few minutes to soften the shell. The chicks will not need any food for five or six hours after hatching, when a little boiled rice or soft food may be given three or four times a day. Give a little, and often. There are two important points in poultry rearing—first, “good breed”; second, “good feed.” This will give early layers or rapidly maturing table fowls. It is a great mistake to run more than sixty or seventy fowls in a flock. Where larger numbers congregate there is sure to be disease and many deaths after a short time. The large, strong fowls get most or all of the food thrown to the flock, and what they do not eat they trample under foot and defile with mud and filth. Chickens and small fowls should be separate from the larger ones, and a coop with wire front, so that the little ones only can get through, is a good contrivance. Cleanliness in feeding troughs, houses, and everywhere else is a necessity. Do not leave any food lying about, or in excess of what the fowls can clean up; else rats, mice, and other vermin will abound. The best food for young chicks is coarse oatmeal mixed with stale bread and some finely-chopped green grass. Equal parts of bran and pollard, or oatmeal and bran, or maize meal is good for chicks. Soaked bread is not good, as it is weakening and causes diarrhoea. Minorcas are to be preferred for laying, next Andalusians, and white and brown Leghorns come last. Indian Game and Dorking make the best cross for table fowls.

Burra, October 12.

Present—Messrs. F. A. S. Field (chair), Joseph Field, F. Duldig, J. Arnold, A. McDonald, E. Goodridge, Hon. J. Lewis, M.L.C., and R. M. Harvey (Hon. Sec.).

CONGRESS.—Chairman said he had attended the recent Congress of the Bureau in Adelaide, and was much pleased. The paper that would most interest members of the Burra Branch, he thought, was upon "Breeding Horses." He considered that much valuable information was gained by the annual visit by members of the Bureau to the Roseworthy Agricultural College farm.

COMMERCIAL FERTILISERS.—Mr. McDonald said their crops that had been manured with Thomas phosphate this year were regular right through, and thought this manure was quite equal to English super. Crops fertilised with super. were of different colors and were patchy. Thomas phosphate also shows well on limestone lands.

LOCUSTS.—Mr. Duldig wished to know how to destroy young locusts. He thought a good deal might be done by driving a flock of sheep over them, or perhaps some cheap poison might be devised. [Driving sheep or dragging bushed harrows over them would kill a good many, but poison will destroy them wholesale. Read my reply to similar question in report of meeting of Boothby Branch in present issue.—GEN. SEC.]

STANDARD BUSHEL.—Members concluded that the present system of selling by standard of average quality to be inequitable, and are of opinion that permanent standards Nos. 1 and 2 ought to be fixed.

BUNT.—Members are convinced that careful pickling of seed wheat with bluestone solution will protect the crop against bunt.

Cherry Gardens, October 15.

Present—Messrs. T. Jacobs (chair), C. Lewis, J. Lewis, G. Hicks, J. Potter, G. Brumby, H. F. Broadbent, A. Broadbent, E. Wright, C. Ricks (Hon. Sec.), and one visitor.

FIELD POPPY.—This weed is spreading rapidly in the district, and doing much damage amongst crops. Members resolved to use every effort to eradicate it.

PILES IN PIGS.—Mr. Jacobs said he had cured his pigs of piles by giving one teaspoonful of flowers of sulphur with its food twice a day.

Millicent, September 1.

Present—Messrs. H. F. Holzgreffe (chair), H. A. Stewart, G. Mutton, W. H. Rich, W. J. Whennen, W. R. Foster, R. Campbell, H. Oberlander, H. Hart, S. J. Stuckey, A. McRostie, and E. J. Harris (Hon. Sec.).

SEED EXPERIMENTS.—Members and others are regularly growing the following crops from seeds received from Central Bureau:—Algerian oats, Medeah wheat, Dart's Imperial wheat, Paspalum dilatatum, Graf peas, Lettuces, viz., Early Summer, Early Green Stone, and Mammoth Butter-head, Long Red carrot, Allhead cabbage, Salsify, Dark Curly-leaf parsley. Several other varieties had already been in cultivation here, such as Canadian Wonder beans, several squashes, melons, &c.; many seeds, including Cow peas.

WORMS IN PIGS.—Mr. R. Campbell said that it had been recommended to mix a small quantity of sulphate of iron in the food of pigs as a remedy for

worms. The pigs appear to like the medicine, and do well on it. The *Cable* recommends—1. Half-ounce doses every four hours, until purging begins, of a mixture of equal parts of fluid extract of speigelia and senna. 2. Turpentine in milk, from one to twenty drops, three times a day. 3. Strong decoction of tobacco, in teaspoonful doses, each day for three days. All doses are for full-grown pigs.

LICE ON CATTLE.—In 2galls. boiling water shred 1lb. soap and pour in 1qt. of coal tar drop by drop, stirring well all the time. Rub some of this all over the animal, using a rag, until its hair and hide are thoroughly saturated. Keep the animal sheltered for a day or two.

Meningie, October 13.

Present—Messrs. M. Linn (chair), T. Joy, S. F. Robinson, A. J. Myren, C. J. Shipway, H. May, and H. B. Hacket (Hon. Sec.).

ANNUAL CONGRESS OF BUREAU.—Mr. W. Tiller, who attended Congress as a delegate in company with Mr. W. Robinson, said that the meetings at times were not as orderly as should have been, and considered the discussions at the Branch meetings were more practical and useful. He thought the decision *re* licensing of stallions unfair, as the whole of the Branches had not properly considered the subject. [Two or three recently-established Branches have not considered the subject; but about four years ago over 100 Branches were asked to discuss the matter, and a considerable majority favored veterinary examination for soundness of all stallions used for hire; no horse to be used for hire unless certified sound, and a moderate fee to be paid for examination.—GEN. SEC.] Members thought the so-called “mongrel” horses had been more the result of poor pastures and bad feeding than of bad breeding. A resolution was carried—“That all matters to be brought before Conference, if likely to involve a recommendation for legislative action, should be embodied in notices of motion, to be forwarded to the General Secretary [at least two months previously—GEN. SEC.], so that each Branch shall have an opportunity of discussing the same and instructing its delegates accordingly.”

MANURES.—Mr. Shipway favorably mentioned a certain “No. 3 medium” bonedust. Mr. W. Tiller said some of the manures could not be depended upon. Although they are supposed to be analysed by an expert they can afterwards be adulterated. He understood imported manures were sold with the guarantee of the English firms; but it was unlikely that anyone here would take the trouble to take action against an English firm. He thought there should be some sort of Government bond store for their manures to prevent fraud. [These insinuations are totally unjustifiable with respect to imported manures. There is no doubt whatever attachable to the perfect sampling of each cargo, and the analyses are *actually* conducted—not “supposed” to be—by a thoroughly qualified analyst; and, finally, the manures are removed from the ships’ holds directly into trucks and sent on to the farmers who purchase them. If the large importing firms wanted to “adulterate” a cargo of fertilisers they would need a very large store whereon to spread the stuff; they would need several men to do the work under direction; and it is altogether nonsensical to suppose that all this could be done without detection. And, lastly, each parcel sold *must* be accompanied with a certificate giving full particulars of the composition of the manure, which is by the law accounted to be a guarantee upon which action can be taken against the vendor in South Australia.—GEN. SEC.]

MAINTENANCE OF EFFICIENCY OF BRANCH.—On the motion of the Hon. Secretary a ballot was taken to decide which members in succession shall take

the responsibility of reading a paper, originating a discussion, or bringing forward a practical matter to occupy the attention of members at meetings of the Branch.

BREACHY BULLS.—Mr. A. J. Tyren showed an illustration of a method of preventing bulls breaking through fences, somewhat similar to that invented by Mr. Smith, of Reynella, as illustrated in *Journal of Agriculture* of April, 1898, page 687. The contrivance consists of a $\frac{3}{4}$ in. iron bar, about 27 in. long, with a hook at one end and a hole at the other for the nose-ring. In the middle of the bar are a few holes, through one of which a wire is tied, and the ends of the wires are fixed through holes drilled through the ends of the horns, so that the weight of the bar and of the nose-ring is supported by the wires affixed to the horns. He also showed another sketch of a bar affixed to the points of the horns. From the junction with each horn a piece of wire is affixed to the nose-ring.

Wilson, October 6.

Present—Messrs. D. McNeil (chair), W. H. Neal, R. Rowe, A. Crossman, T. Matthews, J. Coombes, A. Canning (Hon. Sec.), and one visitor.

CONGRESS.—The Chairman and Hon. Secretary reported upon proceedings at the late Congress of Bureaus in Adelaide, and upon visit to the Roseworthy Agricultural College. At the college they gained a lot of valuable knowledge concerning manures and crops. It was decided to consider the papers read at Congress successively at the meetings of this Branch.

Mount Bryan East, October 6.

Present—Messrs. T. Wilks (chair), E. T. Prior, A. Pohlner, J. Honan, W. Dare (Hon. Sec.), and one visitor.

ANNUAL REPORT.—Hon. Secretary reported ten meetings during year, with an average attendance of six.

CONGRESS.—Chairman gave a lengthy address upon all the papers read at the late Congress in Adelaide, which he had attended.

OFFICERS.—Chairman and Hon. Secretary thanked. Mr. E. T. Prior elected Chairman and J. Honan Hon. Secretary.

Woodside, October 8.

Present—Messrs. R. Caldwell (chair), A. Pfeiffer, A. Lorimer, C. W. Fowler, G. F. Lauterbach, W. Rabach, E. Esau, J. D. Johnson, and A. Hughes (Hon. Sec.).

REMARKS ON THE FARM.—Mr. Esau read a paper, of which the following is the substance:—

The most important question is that of labor. If dairying is followed it is difficult to find remunerative work to employ the milkers between the busy seasons, or even between the two daily milkings, so the whole cost has to be debited to the dairy. Hay-growing at present prices will not pay, and he had concluded that either apple-growing for export or a vineyard, or both, would advantageously employ the time of the laborers in the slack seasons—the produce would practically be all profit. Whatever kind of cow is kept, the adage holds good that "The milk goes in at the mouth"; therefore the cows must always be kept in good condition. Sub-division of large paddocks and frequent resting of pastures is most beneficial. The most profitable time for cows to come in is August, as then they have the spring grass, and will give the greatest quantity of milk for the year. It does not pay to buy feed for cows during autumn and winter. He did not think it pays to build byres and shelters for cows; but if

sheltered hillsides are available it might be advantageous to plant pines and other trees to serve as windbreaks. Pigs pay to keep if worked judiciously. He would pig-proof two paddocks, and crop each alternately with peas and wheat; the soil for peas to be heavily manured with phosphate, and the crop fed off by the pigs. A heavy crop of hay could then be raised on that field. He thought some of the hay now grown in the district might give place to sheep, and perhaps it might be advantageous to have late lambs, which need not be shorn until next season.

Lyrup, October 9.

Present—Messrs. P. Brown (chair), W. Healy, G. A. Bollenhagen, J. Sykes, A. Pomeroy, A. Weaver, O. Klemm, W. H. Walling, W. H. Wilson (Hon. Sec.), and two visitors.

SEED EXPERIMENTS.—Johnson grass and salsify grow only too well in this locality, and are becoming a nuisance. Natal Red-top grass, Dart's Imperial wheat, and Danish Island oats grow remarkably well; Wheat grass and Gramma grass, Japanese climbing cucumbers, all kinds of lettuces, onions, melons, and tomatoes did well. All plants grown here have been grown under irrigation.

Orroroo, September 28.

Present—Messrs. W. S. Lillecrapp (chair), G. Matthews, J. Jamieson, M. Oppermann, E. Copley, J. Moody, and T. H. P. Tapscott (Hon. Sec.).

CONGRESS.—The delegates and visitors from this Branch to Congress gave lengthy and interesting reports of the proceedings. Some of the papers were then read and discussed.

LOCUSTS.—Locusts are doing much damage to feed and late-sown crops.

Redhill, October 4.

Present—Messrs. R. T. Nicholls (chair), W. Stone, W. Steele, A. E. Ladyman, D. Steele, D. Lithgow, R. T. Siviour, H. Darwin, F. Wheaton, L. R. Wake, J. N. Lithgow (Hon. Sec.), and two visitors.

CONGRESS.—One delegate to Congress gave a very interesting report, and an animated discussion ensued.

SEED EXPERIMENTS.—The wheats received from Central Bureau are doing very well

Arthurton October 4.

Present—Messrs. W. H. Hawke (chair), M. Lomman, J. Koch, C. L. Palm, M. Baldock, T. Baldock, W. E. Hawke, J. B. Rowe (Hon. Sec.), and six visitors.

HOMESTEAD MEETING.—Members met at the farm of Mr. Palm, where Mr. Freeman gave a practical lesson in castration of colts, which was greatly appreciated. The homestead was regarded as being highly creditable to its owner.

PLOUGHS WITH SEED AND FERTILISER DRILLS.—Mr. Hawke expressed the opinion that the best results will be obtained where the seed and manure are laid together in the furrow, and covered at the same time, in preference to sowing on the surface and then ploughing under. He thought it desirable to have a practical test made between these ploughs with drills attached and one

of the best seed and manure drills, and was prepared to open a subscription-list for the purpose of offering a prize for competition under the auspices of the N.Y.P.F.T. & S. Society with this object in view. Two other members offered similar contributions. It was resolved to submit this matter and some others connected with the exhibits by importers, &c., of implements to next meeting of the above society.

Wilmington, October 8.

Present—Messrs. Wm. Slee (chair), H. Noll, F. Bauer, A. Maslin, J. Lauterbach, J. Zimmermann, and H. G. S. Payne (Hon. Sec.).

CONGRESS.—Mr. Maslin reported attendance as delegate at Agricultural Bureau Congress in Adelaide. Many of the papers read were of considerable importance to farmers, and should be carefully studied by all the Branches. The Congress was profitable, but he must say that at times the pleasure in the proceedings was marred by disorder. Resolved—That all members be requested to read the October *Journal* and come prepared at next meeting to discuss the papers that apply to this district.

Yankalilla, October 18.

Present—Messrs. J. Crawford (chair), G. Newbold, H. Leverington, A. Wood, G. H. Macmillan (Hon. Sec.), and two visitors.

POISONOUS WEED.—This meeting was specially convened to consider what shall be done to exterminate a poisonous weed which has escaped from cultivation and is rapidly spreading in this district. It is known to gardeners as "Cape bulb," and to botanists as *Homeria collina*, with synonyms "*Bobartia*," "*Moraea*," "*Collina*," &c. It has poisoned some of the live stock here, and a letter from the General Secretary stated that human beings in Cape Colony had been poisoned through eating the corms (called "bulbs" by many people.) After some discussion it was resolved that the attention of the district council be called to the urgent necessity for taking immediate action to prevent the spreading of the poisonous weed known as *Homeria collina*. The members are of opinion unless this is done great loss will ultimately result to the district.

Renmark, October 4.

Present—Messrs. Captain Moffatt (chair), R. Kelly, H. Forde, C. Millar, F. Cole, and E. Taylor (Hon Sec.).

APIARY.—Mr. R. Kelly said he had visited the apiary of Mr. Pfitzner, at Morgan, and as a consequence he had decided to start a few hives at once.

MANURING TREES AND VINES.—Mr. H. Forde read the following paper:—

The use of fertilisers is of vital importance to Renmark, and a few notes on the most profitable and economical use of them may be of interest. A remark which can hardly be too often repeated is that superphosphate in contact with the soil deteriorates; the lime attacks the super., and reduces it to the condition of tricalcic phosphate, which is insoluble, and therefore much slower in action, as plants can only absorb the soluble portions of the fertilisers. Only 37 per cent. of the super. on the market is soluble, so that at £5 per ton we pay nearly £14 per ton for the portion that is useful to us. We should, therefore, inquire which is the best method of applying it. Some of our settlers, copying the wheat farmers, scatter it broadcast. There it lies, losing some of its value, till the irrigation water or a heavy rain takes it down. It has to sink from 1ft. to 3ft., losing still more, before it reaches the roots; it follows that the upper layers of soil are richer in phosphate than the lower, and the roots are attracted to the surface, there to be scorched or ploughed up. It is evident that broadcasting is *not* the way to do it. Others use a seed drill, which is no better. One settler who thus used bonedust last year finds the plough turning up little masses of bonedust with

the roots clustered round them. 'This, also, is not the way to do it. Wheat-farming is not fruit culture. The farmer has to consider only the upper 12in. of his soil; we must improve ours as deeply as we can. I have made a few experiments, carrying out what I have seen done in the botanic gardens at home. When a tree shows signs of weakness they dig a trench round it, cutting the roots, and fill it in with compost. I have done the same with some trees. The result is as yet seen only in an orange, which I trenched in July last. It was a miserable specimen, only 4ft. high, though 6 years old, and had never borne. It is now growing vigorously, covered with blossom and small fruit. This is, I think, the best way to do it; but how can it be done economically on a large scale? Very few of those I have spoken to realise the necessity of burying the manure deeply, of cutting the roots, and placing the fertilisers in contact with the cut surfaces. From each of these will spring a fringe of fibres, through which the plant absorbs nutriment. One of the few, a practical man, who has been growing things all his life, has ploughed trenches between his vines, cutting the roots, and has deepened them with pick and shovel to 18in. It is possible to root-prune too severely. I have heard of an orchardist who subsoiled his ground with six-horse teams as close to the trees as he could get; his trees are all dead. Everyone, I suppose, will agree that the roots should be cut cleanly and not lacerated. How this should be done, whether by a disc plough or by an instrument specially contrived for the purpose, I leave to those more skilled in the use of implements.

[There is room for a good deal of explanation and discussion on Mr. Forde's remarks; but not a word of what might and ought to have been spoken appears in the report sent down.—GEN. SEC.]

Gladstone, October 6.

Present—Messrs. W. A. Wornum (chair), J. Shephard, J. Burton, C. Gallasch, D. Gordon, J. Milne, and one visitor.

CONFERENCE.—Decided to hold a Conference of Northern Branches at Gladstone during the second week in February.

EXHIBITS.—By Mr. Tonkin (visitor)—Bartlett's Crossbred wheat, early, but not prolific. By Captain Moffatt—Algerian oats, from a crop estimated to yield $2\frac{1}{4}$ tons, not manured, and the fourth crop in succession; also Topp's Winter rhubarb. By Mr. Shephard—Plant of Sullivan's Early Prolific wheat, bearing seventy-seven fine heads.

Mount Gambier, October 13.

Present—Messrs. M. C. Wilson (chair), J. C. Ruwoldt, J. Dyke, W. Barrows, T. H. Williams, W. Mitchell, and E. Lewis (Hon. Sec.).

BORS.—Mr. Ruwoldt directed attention to a reported cure for bots in horses published by the New Zealand Department of Agriculture. [This consists of an infusion of tansy (*Tanacetum vulgare*), which is commonly grown in gardens, and is used by country people in Europe for making "tansy tea." According to Bergius the virtues of tansy are tonic, stomachic, *anthelmintic*, emmenagogue, and resolvent. Tansy has been much used as a vermifuge. Dr. Collins certified that tansy had been found of use in cases of gout. These items are taken from an ancient work on medical botany.—Gen. Sec.]

BUTTERCUPS.—Mr. Ruwoldt tabled a weed resembling a buttercup which was prevalent and undesirable. The Hon. Secretary said the General Secretary had informed Mr. Watson last year that the weed was the buttercup (*Ranunculus acris*). Members did not agree with this view. [Members were quite right, and the General Secretary is now satisfied that the weed is *Ranunculus parviflorus*, a native common to nearly all parts of South Australia.—GEN. SEC.]

TUBERCULOSIS.—Mr. Williams showed sample of tubercle taken from the udder of a cow. Within the last nine weeks he had discovered seven cases of tubercle in the udder, and in nine cases he had found the bacillus in milk. He urged owners of cows to closely observe their udders. He had been asked to

examine a cow which had a running from the ear, and he found deeply-seated tubercle in her udder; she was about five years old, and he had destroyed her mother three years ago on account of tuberculosis. The nodules in udders ranged from the size of a pea up to as large as an orange. Where one part of an udder is larger than another, with hardness, there is cause for inquiry. To destroy bacilli in milk it should be subjected to a heat of 160° F. for ten minutes. The germs of tubercle have been undoubtedly at times conveyed on the milker's hands from a diseased to a healthy cow's udder, where they gained an entrance through cracks or scratches.

SHEEP-DIPPING.—Mr. Williams said it is particularly necessary to take extra care with longwools, on which lice give the greatest trouble. If found effective they should be dipped straight after shearing and again in about three months' time. They must be dipped twice. Mr. Mitchell said when sheep are dipped off the shears the liquid sometimes causes the small sores made by the shears to fester; again, if heavy rain comes soon, the dip is washed off the thin wool. He preferred to dip three weeks after shearing. Mr. Williams replied that this would answer well where ticks only were present, but where there are lice it is better to risk festering and dip at once. He did not know of one case where lice had been got rid of with one dipping.

Paskeville, October 6.

Present—Messrs. A. Goodall (chair), A. C. Wehr, G. Bammann, S. Meier, J. P. Pontifex, J. H. Nankervis, and W. S. O'Grady (Hon. Sec.).

SEED EXPERIMENTS.—Messrs. Wehr and Bammann (to whom were entrusted the samples of wheat received from the Central Bureau) reported that they were doing well.

BEST WHEATS FOR DISTRICT.—It was generally agreed that Purple Straw is the best all-round wheat, and Dart's Imperial close after. Several members believe that the latter and Bluey are identical. Change of seed is deemed to be desirable. They would be glad to know which is better—from a dry to a moist climate, or from a moist to a dry district.

FIELD TRIALS.—The Chairman advised that a conference be promoted between the Field Trial Society and the Harvesting Machinery Union, with a view to inducing the latter to reconsider their determination not to enter for competition or otherwise at field trials. He thought that the prize-money might perhaps be divided amongst exhibitors to pay cost of transit, &c., if they refused to compete for it.

Eudunda, October 8.

Present—Messrs. J. von Bertouch (chair), C. Wainwright, H. Hage, E. T. Kunoth, F. W. Paech, M.P., H. D. Weil, C. Pfeiffer, and W. H. Marshall (Hon. Sec.).

DEATH OF A MEMBER.—Hon. Secretary reported death of Mr. August Kluske. Several members spoke in eulogy of their late fellow-member, and a letter of condolence was directed to be sent to his family.

STALLION LICENCE.—Members are in favor of all entires used for hire being subject to examination by a veterinary surgeon, and only such as are proved to be sound to be licensed to stand for hire.

BRANCH WORK.—At the meeting on September 11, when Messrs. H. Martin, H. Hage, J. A. Pfitzner, C. Wainwright, and the Hon. Sec. were present, it was resolved to endeavor to increase the usefulness of the Branch by aid of lectures, homestead visits, and in other ways; and on October 8 the matter was further discussed.

Gawler River, October 5.

Present—Messrs. J. Badman (chair), J. Drinkwater, H. Heaslip, D. Humphreys, F. Roediger, J. Hillier, R. Badcock, T. P. Parker, A. Bray, C. Leak, H. Roediger (Hon. Sec.), and one visitor.

CONGRESS.—Mr. A. Bray, a delegate to Congress, remarked that there were no papers or discussions on fruit culture.

HAY.—The Hon. Secretary was informed that loose hay for farmers' own use should be cut a little greener than if for chaffing. For chaff the grain should be well formed before cutting.

FERTILISERS.—Some members reported good results from use of guano super. this season, and that the sandy soils, on account of the wet and cold, would not give such good results as the heavier lands.

RAISINS.—Mr. A. Bray mentioned that the market price of Sultanias was lowered in California through the advent of "seedless" Muscatels. [The ordinary Muscatel raisins are run through a machine which extracts the seeds. There is also a small hand machine, costing only a few shillings, which is used in the kitchen.—GEN. SEC.]

Onetree Hill, October 12.

Present—Messrs. J. Bowman (chair), H. H. Blackham, A. Adams, F. L. Ifould, and J. Clucas (Hon. Sec.).

OFFICERS.—Messrs. Bowman, Hogarth, and J. Clucas were re-elected Chairman, Vice-chairman, and Hon. Secretary respectively.

ATTENDANCE.—The Hon. Secretary mentioned that the attendance of members during the twelve months' meetings had been 7.5, which was considered satisfactory. [An average of fifteen would be far better.—GEN. SEC.]

HAY CROPS.—Some hay crops which appeared to be heavy have proved signally disappointing. Withered flag was strikingly apparent. Members thought the crops had been sown too early for the present season, and consequently there had been unseasonable growth. Cases were mentioned which seem to bear out that theory.

Kapunda, October 6.

Present—Messrs. W. Flavel (chair), G. Teagle, H. King, J. H. Pascoe, W. M. Shannon, R. Shannon, H. T. Morris, C. P. E. Weckert, J. J. O'Sullivan, Peter Kerin, Pat Kerin, and G. Harris (Hon. Sec.).

CONGRESS.—Delegates reported on visit to the Twelfth Annual Congress of the Bureau in Adelaide. They were pleased with the result, and believed these meetings were beneficial to all farmers. Mr. G. Teagle was opposed, however, to the resolution arrived at to recommend legislation requiring veterinary examination for soundness and a licence for all entires used for hire. Mr. Shannon strongly approved of Mr. Marshall's paper, and recommended farmers to try the plan of drilling in phosphatic manures before seeding. He thought 45lbs. seed should be grown for grain and 60lbs. for hay. Members generally favored the seed drill and manures, and thought drilling should immediately follow the scarifier.

HARVESTING WHEAT CROPS.—In discussing Mr. W. M. Shannon's paper, read at previous meeting, Mr. King thought the outlay on machinery was too heavy. Mr. O'Sullivan was in favor of the header, as the straw, when chaffed, makes good feed for horses and cattle. Mr. Teagle thought farmers should co-operate and purchase some of the more costly machinery. The straw, in seasons of plenty, could be baled by a continuous press, and the bales used in erection of sheds and chaff houses. In seasons of scarcity these bales could be used for feeding stock.

Finniss, October 1.

Present—Messrs. T. Collett (chair), S. Eagle, H. Langrehr, J. Chibnall, W. A. Heath, F. Dreyer, S. Collett (Hon. Sec.), and one visitor.

DAIRY BULLS.—The Hon. Secretary reported safe arrival of the Jersey bull Mostyn, purchased by the Branch with the assistance of the Department, which provided half the purchase-money. The Branch undertakes for three years to allow the public to make use of the services of the bull at a low fee, and to report to the Department every six months on the extent to which the bull's services are availed of. Members inspected the bull, and expressed favorable opinions on his value.

OFFICERS.—Mr. J. Chibnall was elected Chairman, and Mr. S. Collett re-elected Hon. Secretary for the ensuing year.

CONGRESS.—Messrs. Heath and Dreyer reported on proceedings of the recent Congress, and it was agreed to discuss Mr. Davis's paper on "Growing and Management of Hay" at the next meeting.

Port Germein, October 6.

Present—Messrs. G. Stone (chair), W. Head, P. Hillam, J. K. Deer, E. G. Blesing, H. Kingcome, E. McHugh, J. R. Gluyas, and A. H. Thomas (Hon. Sec.).

BULLS.—The majority of members prefer the Jersey breed for this district.

CONGRESS.—Mr. Blesing gave a lengthy and interesting report of his attendance at the twelfth Annual Congress of the Bureau, also of the work carried out on the farm at the Roseworthy Agricultural College. Both were of the greatest benefit to South Australian farmers. Mr. Stone strongly supported his remarks. Thanks accorded to the delegates.

FLOUR-TESTING.—A resolution was carried to the effect that it is desirable that the flour-testing mill now lying at Roseworthy Agricultural College ought to be set up at the School of Mines, so that farmers can send samples of wheat to be tested.

PIG-BREEDING AND BACON-CURING.—Mr. Blesing read the following paper:—

Having for nearly thirty years taken a deep interest in the industry, and during some of the bad seasons in the past I have found that butter, bacon, and pigs have materially helped to make both ends meet, I am in a position to know a little about the subject.

As to the best breed of pigs, the vital question is—which pig will produce the most bacon with the least amount of feed? There are four distinct breeds generally kept, viz.:—the Berkshire, Essex, Poland China, and White Yorkshire. Undoubtedly the Berkshire pig gives a maximum of lean meat with a minimum of fat, which is a consideration with most people, whereas the Essex gives a larger amount of fat in proportion to the lean; yet where lard is the object, an Essex will yield as much as two Berkshires, and of a superior quality. I find I can fatten three Essex pigs with the same quantity of feed that it takes to fatten two Berkshires, and there will be very little difference in the weight of each pig. In addition, the Berkshire pig invariably takes to eating poultry, even when well fed, which the Essex rarely do. Having tried the four breeds mentioned, I have come to the conclusion that the best pig is a cross from an Essex boar mated with a good Berkshire sow. The pure Essex sows are very unprofitable for breeding—in fact, some will not breed at all, others only one litter of six or seven a year—whereas most Berkshire sows will have two litters a year of eight to ten each litter. These at 7s. each when six weeks old will yield a handsome profit on the feed. It does not pay to keep pigs over twelve months old, except for breeding or show purposes, as the most saleable bacon is that from pigs under 150lbs. weight.

Curing of Bacon.—My practice is not to kill bacon pigs until May, or until frost has made its appearance, as it is not safe until then. By following this rule I have not had bad ham or bacon for twenty-five years. I am also careful to cut the hams the proper shape, as badly shaped hams, though otherwise good, do not sell well. As I always roll my bacon (except when otherwise ordered), I take the bone clean out of the shoulder and roll it all together. The advantage of rolled bacon over fitches is—especially when kept for any length of time—

the lean meat remains soft and palatable, whereas in fitches it gets hard and dry and tasteless. I never dry salt, as that process is a great deal more trouble and labor, and the bacon gets hard and more salt. I simply give both hams and bacon when cut up a good rubbing with a mixture of salt, saltpetre, and loaf sugar in the following proportions:—12lbs. salt, 1lb. saltpetre, and 2lbs. loaf sugar. The hams are then put into the pickling cask by themselves, and covered with pickle strong enough to float a fresh egg, or 1lb. salt to 1gall. of water, with a proportion of saltpetre and loaf sugar added, and if free from blood will require very little more attention—except an occasional turning—until cured, which will be in about six weeks, that is, hams from 15lbs to 20lbs.; if larger they will require longer. Bacon I generally leave from fourteen to eighteen days in pickle, then hang up for a day or two to dry, and afterwards roll carefully (some spiced, some without, according to order), and hang up to smoke for three or four days. By following this method I can produce as good an article as any factory, and there is no reason why farmers should not produce as good an article as a factory.

As to feed, my practice is to boil all the feed when fattening pigs, as I find it more economical and they like it better. A change of feed is beneficial also. Barley I find produces the firmest bacon, but pigs do not fatten so quickly on it as on wheat. One important point is to keep the sties warm and dry, and not to overcrowd them. Three or four pigs are enough for one sty. For about six months in the year I feed my pigs on skim milk and green stuff only.

Yorke town, October 8.

Present—Messrs. J. Koth (chair), C. Domaschenz, A. E. Anderson, and John Davey (Hon. Sec.).

SEEDING.—Alluding to paper by Mr. McEwin, of Brinkworth, on “Quantity of Seed Wheat per Acre,” Mr. Koth thought 35lb. would be much too thin in this district for the average sorts of wheat grown; but 35lbs. of sorts that stool well might do on strong soil where there is a good rainfall. But it should be borne in mind that both the stripper and the drill are apt to crack a lot of the grain, and this should be allowed for when sowing, else the number of plants on the square yard of ground will be much less than ought to be expected. Members thought it better to sow a little too much than not to sow enough.

SETTING OF EGGS.—Mr. Anderson said he had seen it stated in print that the percentage of chicks hatched will be greater if the eggs are stood on the large end. He wishes someone to tell him how long should the eggs stand on end to secure this result.

WEED.—Mr. Domaschenz tabled a plant which is growing thickly on Mr. Twartz’s paddock. His horses grazing in that paddock became stiff in the legs, and it was thought this plant might be the cause. [The plant sent is identified by Mr. J. G. O. Tepper, F.L.S., as *Teucrium sessiliflorum*, decidedly not poisonous.—GEN. SEC.]

Port Elliot, October 20.

Present—Messrs. J. McLeod (chair), O. B. Hutchinson, J. Brown, W. E. Hargreaves, H. Gray, C. Gosden, H. Welch, H. Pannell, J. R. Coote, and E. Hill (Hon. Sec.).

CULTIVATION OF THE SOIL.—Mr. J. Brown read a paper, in which he strongly advocated deeper ploughing and better cultivation of the land than is usually practised. Several members expressed the opinion that deep ploughing would ruin the land by bringing the subsoil to the surface, but it was pointed out that as this was never advocated those who raise this time-worn argument whenever deeper cultivation is urged are fighting a shadow. Mr. Welch agreed mainly with Mr. Brown. He had known land in the district which had been cropped continuously for forty years or more, but which had never been really ploughed. Sheep help to keep the land clean, but care must be taken not to overstock. Rotation of crops was a sound principle. Greater care should be

exercised in the sowing of seed wheat, too much grain being cracked by the stripper. Usually too much seed was sown to allow of the full development of the plants. Mr. Coote thought they would have to devise some means of securing better prices for their produce if they were to improve their methods of cultivation, but Mr. Welch contended that if it did not pay to farm well it would not pay any other way. Mr. Brown, in reply, said some time ago he had a paddock which was considered incapable of producing a crop. He ploughed it up to a depth of 7 in., and several persons did not fail to tell him he was a fool to do so. As he reaped 11 bush. per acre of good clean wheat he held a different opinion. He maintained that it would pay to increase the depth of the soil broken up, even if done only gradually by going an inch or so deeper each year until at least 7 in. was reached.

Quorn, October 8.

Present—Messrs. R. Thomson (chair), J. B. Rowe, James Cook, C. Patten, H. S. Stacey, H. Cowan, A. F. Noll (Hon. Sec.), also W. Freebairn, J. McColl, A. Knauerhase, and A. J. Searle, of Richman's Creek Branch, M. Eckert, of Arden Vale Branch, and three visitors.

HOMESTEAD MEETING.—During the day the whole party inspected Mr. A. F. Noll's crops and farm. The following is a short report of what they saw and said about what they saw :—

After the visitors had gone over the garden near Mr. Noll's house they were taken to a paddock close by, on the Quorn Road. Here were several plots of wheat, the seed of which had been received from the Central Agricultural Bureau—No. 1, Ranjit; No. 2, Marshall's Hybrid; No. 3, Silver King; No. 4, Majestic. Ranjit showed to advantage over the other three, being well out in head, looking healthy, and of a nice color; Marshall's Hybrid came second; remaining two had stood very well, but are too late for the district. There were also several other plots, containing the following samples:—Bartlett's Crossbred, Indian King, Smart's Purple, Steinwedel, and wheat selected by Mr. Noll, which looked healthy, but was in want of rain. The visitors then drove to Mr. Noll's farm in Richman's Valley to inspect the wheats drilled with and without fertilisers. The first inspected were two sections of between five and six acres each, Purple Straw on the right and Red Straw on the left hand side. These plots were indeed an eyeopener to all present, and expressions of surprise were heard at the evident advantages of using fertilisers, and Mr. Noll was frequently complimented on his practical methods of farming, which he had that day shown, by the results obtained, to be most profitable (from 1½ to 2 tons of hay per acre being cut from these crops, and the estimate for wheat from 20 bush. to 26 bush.). In the centre of the plots was a drill width put in without manure, and the marked difference clearly proved that fertilisers were now necessary to ensure a fair crop. The wheat put in with manure stood about 3 in. or 4 in. taller than that without, whilst the former was free from oats, &c., and the latter very dirty; the explanation given was that manured wheat obtained an early start and choked the weeds. South of these plots was a piece of land of about sixty acres sown with Petatz Surprise, which was also in splendid condition. Another paddock was visited, and blocks of six and a half acres of Sullivan's Early Prolific, five and a half acres of Allora, and some Petatz Surprise, were inspected. In the centre of these also there was a strip right through sown without fertilisers, and which gave another forcible impression in favor of manure. The party then drove to Mr. Noll's dwelling, where a sumptuous repast was partaken of, after which an adjournment was made to the verandah. As several of those present had to leave to catch the evening train, a vote of thanks to the host and hostess was moved by Mr. J. McColl, who remarked that the experiences of Mr. Noll were a lesson which would be of the greatest benefit to the farmers of the district, and he felt sure that in saying "that any success which Mr. Noll's experiments met with were justly deserved," he was expressing the feelings of all present. Mr. J. J. Searle, in seconding the vote of thanks, said that he was pleased to be able to have been present that afternoon and fully indorsed the remarks of the previous speaker, saying that Mr. Noll was not only anxious to benefit by his own experiences, but was willing to freely impart them to others. The vote of thanks was carried with acclamation.

ANNUAL REPORT.—In the evening the annual meeting was held at Mr. Noll's house, where refreshments were provided and the host and hostess thanked, and the Hon. Secretary reported:—"The membership of the Branch

has been reduced from fifteen to eleven members during the year. Eight meetings had been held, with an average attendance of seven members. A successful conference of Far Northern Branches was held in February last at Quorn, which had the valuable assistance of the neighboring Branches; the only regret expressed being that there was not sufficient time to discuss the subjects brought forward. During the twelve months the following papers and discussions were dealt with:—‘Tuberculosis in Cows: The Danger of Infection to Man, and Precaution against Same,’ by Mr. A. F. Noll; No. 2, ‘Turning Stock on Growing Crops,’ discussion by Mr. Herde; No. 3, ‘Stripper *versus* Binder,’ discussion on Mr. Stone’s paper; No. 4, ‘Suggestions for the Improvement of the Branch,’ paper by Mr. J. B. Rowe; No. 5, discussion on Mr. Rowe’s paper. Two delegates had been appointed to attend the Adelaide Congress, and had given a report of same.’ The annual report was adopted and the delegates thanked for their representation at the conference.

OFFICERS.—Mr. R. Thomson (Chairman) and Mr. A. F. Noll (Hon. Secretary) were thanked for past services and re-elected.

Caltowie, October 8.

Present—Messrs. A. Kerr (chair), J. Potter, J. Noonan, G. Petatz, J. A. Leahy, J. G. Lehmann, L. Graham, J. Neate, A. McDonald (Hon. Sec.), and one visitor.

CONGRESS.—Messrs. Lehmann and McDonald reported attendance at the recent Congress of the Bureau in Adelaide. They considered the proceedings thereof to be interesting and instructive.

SEED EXPERIMENTS.—Mr. Lehmann said Ranjit wheat promised to give a small crop; but Majestic, Silver King, and Marshall’s Hybrid were total failures. Mr. Petatz said all four of those varieties were at present looking well with him, but Silver King appeared to be the best. Mr. Potter said all four failed with him. Mr. McDonald reported each variety looking strong and healthy at present. They were sown side by side under the same conditions on June 2, one half of each lot fertilised with Thomas phosphate, and the other half with English super. No perceptible difference was apparent between the effects of the two manures, but the Ranjit had made more progress and promised better than the others; Silver King seemed to be second to Ranjit.

STALLIONS.—Members do not favor co-operation amongst members of Branches in purchase of stud entires with a State subsidy, as horses require a deal more of skilled attention than is necessary for bulls.

Brinkworth, October 19.

Present—Messrs. S. Aunger (chair), A. L. McEwin, R. Cooper, A. W. Morrison, G. Wooldridge, J. F. Everett, W. H. Pearce, and J. Stott (Hon. Sec.).

CONGRESS.—Mr. A. L. McEwin gave a *résumé* of business done at the Twelfth Annual Congress of the Bureau held in Adelaide during September. This occupied a considerable time, and he was thanked.

MARSHALL’S HYBRID WHEAT.—Mr. Morrison tabled samples of this wheat. Five ears were bearded and five without beards. Members wish to know the reason. [Reversion to one of the original parents of the cross. All new cross-bred plants have a tendency to revert or produce several varieties or variations from the type that is wanted.—GEN. SEC.]

Dawson, October 6.

Present—Messrs R. Renton (chair), P. J. Byrne, Jno. Collins, C. W. Dowden, A. J. Hooper, C. H. Meyers, O. Muller, J. H. L. Severin, A. H. Warner, Rev. C. Doley, and A. F. Dempsey (Hon. Sec.).

CONGRESS.—Delegates reported on proceedings of Congress, the Hon. Secretary referring to paper on "Provision of Fodder for Seasons of Drought." Members agreed that nothing more could be done in this district in the way of laying in stores of fodder, but strongly recommended the erection of sheds for storage of cocky chaff. Sheds supported by forked timber and enclosed with stone, slabs, or iron walls, or even wire netting would do.

STANDARD SAMPLE OF WHEAT.—Members are much disappointed with the result of the recent Conference, and strongly support Professor Lowrie in endeavoring to obtain fixed standards.

EXPORT OF BUTTER.—It was resolved that the Branch supports the action of the Dairy Instructor in regard to the export of butter under misleading brands. The members strongly condemned the practice of shipping low grade butter bearing brands purporting to cover a first class article.

LOCUSTS.—Attention was directed to the damage being done by locusts, which were swarming in different parts of the district. It was decided to ask the Central Bureau to get some of the locust fungus if possible for trial in this district.

DAIRY BULLS.—The Hon. Secretary reported purchase of Jersey bull "Dick" by the Branch, with the assistance of the Department of Agriculture.

HORSE COMPLAINT.—The Hon. Secretary reported that one of his horses was suffering from a swelling in the off flank and along the abdomen. He was afraid sand and worms was the cause of the trouble. The Chairman advised giving a few bran mashies at intervals, and then, on an empty stomach, give 2lb. treacle in half a gallon of water, followed by 2½ozs. turps in a bottle of linseed oil.

Maitland, October 6.

Present—Messrs. H. Wundersitz (chair), A. Jarrett, H. Bawden, J. Hill, J. Smith, Thos. Bowman, W. Adams, J. Kelly, and C. W. Wood (Hon. Sec.).

CONGRESS.—Delegates reported on proceedings of recent Congress. They both voted against the proposal to license stallions. Mr. Hill spoke very highly of Mr. Dall's paper on "Economy of Labor on the Farm," it being well worth careful consideration of all farmers.

HORSES.—Paper by Mr. Hawke, of Amyton, read at Congress, was discussed. Several members were of opinion that it was necessary to tie back free workers, as if left to pull as much as they will they soon wear themselves out. Mr. Bawden was of opinion that it was best to give colts light work when between two and three years old.

TREE-PLANTING.—Mr. Jarrett considered too little attention was given to the question of replanting of timber trees. In a few years' time wood for fencing and fuel would be scarce in this district. He strongly advocated planting sugar gums, either in blocks or along the line of fences. The Hon. Secretary found he could get nothing to grow satisfactorily within 50ft. of his sugar gums, which were ten years old, and thought it would be better, both for shelter and timber, to plant in the corners of the paddocks or in solid blocks in the centre of the paddock. Various opinions were expressed as to best way of planting. The Hon. Secretary finds sowing the seed *in situ* the best plan. Mr. Hill advocated pollarding the gums.

Port Broughton, October 22.

Present—Messrs. J. Harford (chair), H. A. Dolling, James Bates, S. M. Bawden, G. E. Pattingale, W. Tonkin, W. M. Whittaker, and Jas. Barclay (Hon. Sec).

CONFERENCE.—Several letters from Branches and others were received, promising support to Conference of Northern Yorke's Peninsula Branches during February, 1901.

CONGRESS.—Messrs. Whittaker and Pattingale, as delegates, reported upon proceedings at the twelfth annual Congress of the Bureau; also upon what they observed on a visit to the Roseworthy Agricultural College Farm.

Arden Vale, October 8.

Present—Messrs. E. H. Warren (chair), M. Eckert, C. Pearce, A. M. Fricker, L. Warren, F. Schuttloffel, J. A. Francis, G. Miller, A. Hannemann (Hon. Sec), and one visitor.

CONGRESS.—Mr. E. H. Warren read the following with reference to the twelfth annual Congress of the Bureau in Adelaide:—

The meetings of the Conference were well attended, and never before had I the pleasure of seeing so many representative farmers in one assembly. The matter presented for discussion and consideration was good, though when about 1,400 men are constantly pegging away at subjects agronomical it is not easy to discover anything not previously ventilated in the *Journal*. In discussing agricultural matters, one not practically acquainted is apt to wonder at the want of unanimity exhibited, and arrives at the conclusion that the delegates are contradicting each other, when the fact is that so varied are the conditions of soil, climate, rainfall, &c., that no one defined system can be followed in all cases. So apparent is this diversity that no rule of thumb can be observed in the treatment even in farms that adjoin. I will now very shortly refer to one or two matters that may be of interest to the members. Manures.—Except in very exceptional cases, it is now common in the South to drill in the seed with superphosphates. From experiment at the College, the soil there did not appear to require either nitrogen or potash, and the opinion of Professor Lowrie is that phosphatic manure is the dressing at present most needed by our soil. The question yet to be decided in out-districts, with the uncertain rainfall, is whether the difference in yield will pay for the manure and extra labor, and then leave a profit. This matter, however, cannot be ascertained in one year. Hay Chaff.—Members and others who do not see the *Journal* will be glad to learn that the practice of adulterating chaff with straw was not regarded at all favorably by the Congress; it was even suggested that bags containing the mixed article should be branded to that effect. Hay Crop.—I should like to mention that the Solid Straw wheats is sown at the College for hay, and as early varieties do not stool, and fineness of straw is desirable for hay, 1½ bush. of seed per acre is sown, with a dressing first of 2cwt. of superphosphate. Mr. Marshall, of Templers, who uses 200 tons of chaff a year, prefers the solid straw wheat to anything else. The horses do not suffer from the heads. Co-operation.—One notices that at last there is a very active spirit of co-operation abroad among the farmers. The visit of the New South Wales delegates is productive of much good. It may be noticed that the Victorians also intend to establish a Farmers' Union, and the project, which will no doubt be adopted, of having direct agents for the purchase of cornsacks, must be beneficial to the farmers, the unions of the three colonies combining for that purpose. I may inform the members that I did not vote to ride second class, because I do not believe in depreciating the institution to which I belong. As the matter stood, it was simply a question of convenience, enabling one to ride where he liked when there is a large rush on.

PIG-BREEDING.—Mr. G. Miller said his experience with pigs had not been encouraging. He fed them on wheat, and found that, what with trouble and labor, it would have paid him better to have sold the wheat even at 2s. 6d. per bushel. Mr. P. Rogers, visitor from Wyacca, gave actual results of his dealings in pigs. He bought a lot of poor wheat at 6s. per bag, used screenings, milk, and waste, then fed good wheat for a time before killing, and netted about £50. He advised farmers to go in for pig-breeding. Members, however, are of the opinion that the business will not pay in these dry districts, but in the more favored localities pig-breeding should become a profitable business.

RABBITS.—Mr. Pearce strongly advised farmers to enclose their land with wire netting, 3ft. high, with 1½ in. mesh, of best quality, the top slanting outwardly to prevent climbing. The cost would be about £21 per mile. All speakers agreed with him. It was concluded that steps ought to be taken to have Kanyaka declared a vermin district.

Penola, October 13.

Present—Messrs. E. A. Stoney (chair), Dr. F. Ockley, W. Miller, W. P. Davis, S. B. Worthington, L. W. Peake, T. H. Morris, E. McBain, and R. Fowler (Hon. Sec.).

DELEGATES TO CONGRESS.—A motion was carried in favor of first-class railway tickets for delegates attending the annual Congresses of the Agricultural Bureau in Adelaide.

EARMARKS.—No member is in favor of the Bill before Parliament with respect to earmarks on sheep. With a multitude of earmarks there would be difficulty in distinguishing them, and even then the desired end would not be gained by earmarking.

SPRAYING WITH ARSENICAL COMPOUNDS.—Mr. Stoney read a lengthy extract showing the absurdity of the contention by some people that any dangerous effect upon human beings can follow the spraying of fruit trees with arsenical compounds as a protection against ravages by insects.

LICENCE ON STALLIONS.—Members do not favor any proposal for veterinary examination and certificate of soundness (otherwise "licence") for all entire horses for hire. Mr. Morris was of the opinion that very much depends upon the mare, and also upon the feeding, especially whilst the foals are young. No matter what class or stamp the stallion may be, if the mare is not good the progeny will not be good. One reason for horses not being so good now as in former times was that they had not the same scope of country to roam over, nor the same change of pasture. Horses and sheep ought not to be fed together in the same paddock. Mr. McKay held that the depreciation in stamp of horse stock is due to the low prices that have prevailed. No one could breed draught horses for less than £17 to £20.

Richman's Creek, October 18.

Present—Messrs. A. Knauerhase (chair), P. J. O'Donohue, J. J. Searle, J. M. Kelly, M. Hender, J. A. Knox, A. Nicholson, J. J. Gebert, J. McSkimming, W. J. Wright, R. Mattner, J. McColl (Hon. Sec.), A. F. Noll (Quorn Branch), M. Searle (Arden Vale Branch), and visitors.

INSPECTION OF MANURED CROPS.—This meeting was held at the farm of Messrs. A. & J. McColl, Kingswood, for the purpose of inspecting the crops drilled in with commercial fertilisers, an account of which appears in a separate article in this issue. Experimental plots of different varieties of wheat were also inspected. Ranjit and Marshall's Hybrid were doing fairly well, the latter being the better, both having long but rather open heads. Silver King and Majestic were not so early, and were being blighted by the hot winds. Two small lots of wheat from seed grown in West Australia were doing well. Mr. Searle expressed surprise at the condition of the crops, which afford evidence of good cultivation. In the neighborhood he had also noticed good crops on fallow ground, which strengthened his advocacy of fallowing. He considered the difference in the yield of the manured and unmanured crops would more than pay for the cost of the manure, and had more rain fallen the difference

would have been greater. Mr. O'Donohue, while congratulating Messrs. McColl on the results obtained by good farming, doubted whether drilling and manuring would be profitable on much of the country round here where the rainfall was so uncertain. Other members also spoke, and a hearty vote of thanks was accorded to Messrs. A. & J. McColl, and also to Mrs. McColl for entertaining the visitors. In reply Mr. J. McColl said when he and his brother decided to go in for the practice of drilling in the seed with manures they made up their minds to give it a thorough trial. They had put in 180 acres with the drill, all of which except fourteen acres had been manured, 75lbs. per acre of English super. being used. The rainfall recorded on the farm from January 1st to October 18th was 10·8lin., of which 3in. had fallen before they had sown any wheat. They were satisfied that the system would prove beneficial, and would adopt it on a larger scale next year.

CONFERENCE OF BRANCHES—At the request of the Quorn Branch it was decided to co-operate in arranging for the Annual Conference of Far Northern Branches, to be held at Quorn during February next.

CONGRESS.—Delegates to Congress reported shortly on the proceedings. Mr. Searle called special attention to Mr. Dall's paper on "Economy of Labor on the Farm," and also referred to the complaint of short returns from cream sent to the factories in Adelaide. He had sent 5galls. of cream, and received a return for 19lbs. butter only. The following week they churned the same quantity of cream on the farm and got 30lbs. of butter. Mr Hender said the remedy lay in the hands of the farmers themselves; they should establish a producers' central factory. Mr. Knox said he had obtained up to 30lbs. of butter from 5galls. of cream sent to Adelaide.

VISIT TO ROSEWORTHY.—Mr. J. McColl gave a few notes on his visit to Roseworthy Agricultural College. One of the features of special interest was the comparative failure of the crop on one part of the farm through fallowing and afterwards working the land while dry. It showed that judicious working of the land must go hand in hand with manuring to ensure the best returns. Then in another paddock they saw how the after effects of manure enhanced the value of the feed. Land manured and cropped and then left to grass was at the time of their visit growing an abundance of feed though heavily stocked.

Amyton, September 27.

Present—Messrs. Jos. Gum (chair), J. Kelly, Thos. Gum, R. Brown, H. Turner, W. Hughes, Jas. Gray, A. Stone, S. Thomas (Hon. Sec.), and three visitors.

BRANCH LIBRARY.—The Hon. Secretary reported receipt of Bailey's "Principles of Agriculture," for the library.

WOOL-CLASSING.—Mr. Stone read a paper on "The Advantages of Wool-classing," and a short discussion ensued. Members generally considered that while wool-classing would be of advantage to large growers, the man who kept only 200 to 300 sheep would not reap any benefit, though stained or damaged pieces should always be kept separate.

Riverton, October 6.

Present—Messrs. W. Hannaford (chair), D. Kirk, W. J. Kelly, W. Davis, T. Gravestocks, A. J. Davis, H. A. Davis, and H. A. Hussey (Hon. Sec.).

NOXIOUS WEED.—The Hon. Secretary reported that the local council had issued notices for the immediate destruction of the so-called wild onion (*Asphodelus fistulosus*) which has appeared in this district.

ABORTION IN LIVE STOCK.—The Hon. Secretary read from the *West Australian Agricultural Journal* an interesting paper on this subject.

STANDARD WEIGHT FOR CHAFF.—After considerable discussion, it was resolved—"That this Branch is not in favor of fixing a standard legal weight for a bag of chaff, but considers chaff merchants should have the option of putting 50lbs. or more in the bags if desired." The low standard proposed, viz., 40lbs., would very materially add to the cost. For Broken Hill and export 70lbs. to 80lbs. of chaff are put in large brnn bags.

Orroroo, October 24.

Present—Messrs. W. S. Lillecrapp (chair), E. Copley, M. Oppermann, W. Robertson, Jas. Jamieson, J. Scriven, J. Moody, and T. H. P. Tapscott (Hon. Sec.).

HOMESTEAD MEETING.—This meeting was held at the residence of the Hon. Secretary, members inspecting the experimental plots, the orchard and fruit garden, and other items of interest on his well-kept farm.

MELON-GROWING.—A discussion took place on the question of watering melon seeds. It was the general opinion that if rain came before the seeds were planted they did not require watering.

Davenport, October 11.

Present—Messrs. W. J. Trembath (chair), J. E. Lecky, J. Holdsworth, W. G. Pryor, T. McIlowell, and J. Roberts (Hon. Sec.).

CONGRESS.—Mr. Pryor reported that the Hon. Secretary and himself had attended the twelfth Congress of the Agricultural Bureau in Adelaide, and were much impressed with the practical nature of the proceedings and the active interest taken in them by the numerous delegates from the Branches.

ANNUAL REPORT, &c.—The Chairman gave a lengthy report and address upon the work of the Branch during the past year, regretting the want of interest in that work, evidenced by several of its members by non-attendance at its meetings, which should be considered not only a congenial task but also an imperative duty. Unless this spirit animates the members the Branch will become a useless obstruction to the practical utility of the Agricultural Bureau. He urged them to be regular and punctual in attendance, and that each and every member should feel it to be his duty and privilege to contribute to the practical usefulness of the Branch, and through that work to the material progress of the district and the colony generally. He thought more interest could be evoked in their work by arranging for quarterly conversaziones, where pleasures of a healthy kind could be combined with practical work. With good officers and whole-souled members ways and means of popularising the meetings would soon be discovered, and opportunities found for contributing to the social as well as the educative phases of their work. The advantages of membership more than compensate for the time devoted to Bureau business, even if the members did give their best time and intelligence. There had been seven meetings held during the year, with an average of about six members at each. Two papers had been read, and one question-box evening. Many useful discussions had taken place.

OFFICERS.—The Chairman and Hon. Secretary were thanked and re-elected.

BUSINESS.—A special meeting of all members to be called for the purpose of arranging a syllabus for the ensuing year, and with a view to increasing the practical usefulness and adding to the popularity of the Branch.

Naracoorte, October 13.

Present—Messrs. S. Schinckel (chair), E. C. Bates, J. Wynes, B. S. Roach, J. Marcus, G. Wardle, and H. Smith.

CONGRESS.—Mr. Bates and Mr. Wynes reported as delegates, and the Chairman as a visitor, on their attendance and the proceedings at the recent Bureau Congress in Adelaide; also upon the visit to the Agricultural College farm. They considered that much instruction and interest attached to the whole of the work done by them.

POTATOES.—Chairman reported potatoes germinating very poorly this year. Of one lot he had planted only 10 per cent. came up. He thought the seed had either been injured by frost or exposed to the sun too long.

EXHIBIT.—Chairman tabled All-the-year-round lettuce introduced by Central Bureau, sown on March 16th—a very fine well-grown head.

Angaston, September 29.

Present—Messrs. F. Salter (chair), F. Thorne, J. E. Snell, A. Friend. M. Andrew, R. Radford, R. Player, J. Vaughan, A. Sulter, and E. S. Matthews (Hon. Sec.).

CONGRESS.—Messrs. S. O. Smith and R. Player each read reports on the recent Congress of Bureau in Adelaide, which they believed to have been the best yet holden, and urged all members to attend next year.

CENTRAL BUREAU SEEDS.—The Hon. Secretary reported most favorably on experiments with seeds sent out for trial by the Central Bureau, and regretted failures by other Branches as tending to discourage the efforts of the Central Bureau, which is doing so much on so little subsidy. He felt sure most of the failures through want of germination were due, not so much to faulty seeds, as to the haphazard way of sowing them. In many cases no notice is taken of season, soil, or situation. His experience with the Central Bureau seeds was that they compare very favorably with those supplied by first-class seedsmen.

Tanunda, October 10.

Present—Messrs. J. H. Walden (chair), A. Ohlmeyer, C. F. W. Lehmann, G. Mann, J. Gurr, F. W. Giaetz, and C. Heinemann (Hon. Sec.).

BEZOARS.—The Chairman tabled some hairballs taken from stomach of sheep, and caused by fibre of cottonbush.

POTATO-CULTURE.—Mr. F. W. Lehmann read the following paper:—

This is a subject which has had very little attention, especially autumn and winter potatoes. We have hundreds of acres of light sandy soil in our district which, with good cultivation, yield abundant crops of fine potatoes, and are never black or worm-eaten, yielding better prices than summer sorts, and are fresh for market while the imported and Mount Gambier are getting old and unfit for use. For several years I have obtained better results from those raised in autumn than in summer. For autumn potatoes we require a deep sandy soil, to be ploughed 3in. deep not later than October; to be kept clean and loose with a horse-hoe till January, so as to keep the whole moisture in the soil; in January to be ploughed 8in. deep, and plant in every third furrow—about 18in. wide—the fresh cut seed having one eye. We will find the soil as wet as if irrigated. As soon as the soil is partly dry it must be harrowed. There will be no weeds growing, there having been 5in. of fresh soil ploughed up. I do not think it is necessary to hoe and bank up potatoes in our soil, as it only tends to dry the soil opened by the deep furrows. This year I have have harvested 3 tons per acre. Some single potatoes weighed up to 1½lbs. The same piece of land was sown with wheat, and if all goes well will yield 2 tons of hay per acre. This shows how small holders can utilise their land with profit, by getting two crops, and also effecting a good change for the soil. The potatoes sown in January

are ripe at the end of May or early in June, and should be taken up before the heavy winter rains begin, otherwise they would get "waxy." As manure for the land I advise five loads good old stable manure or 4cwt. good fine bonedust to the acre, which ensures a good potato crop, and prepares the land for three cereal crops, viz., barley, wheat, and oats. I recommend the following sorts:—Circular Head, Pink-eye, Blue-eye, Early Rose, and Snowflake.

Members are of the opinion that the best way to plant potatoes is by ploughing in the seed at every third furrow—18in. x 12in.

Bakara, October 5.

Present—Messrs. R. Barrow (chair), J. V. Barrow, J. Roy, R. Wilson, E. Wall, E. J. Dietrich, A. Lehmann, T. Hermann, and F. E. H. Martens (Hon. Sec.).

HARVESTING.—For hay, the crop should be cut just when the straw begins to turn yellow. Where practicable, wheat should be at once cleaned up after the stripper, in place of heaping it in the chaff.

FIELD TRIAL.—A trial of stump-jump ploughs was held at the farm of Mr. John Roy. Only two competed, the judging being done by ballot amongst the visitors. Mr. R. Brophy's received twenty-four votes, and Messrs. J. & D. Shearer's twenty-one.

Mylor, October 6.

Present—Messrs. E. J. Oinn (chair), J. Nicholls, W. Nicholls, E. Wilson, T. J. Mundy, F. G. Wilson, P. P. Probert, J. Roebuck, C. Neilson, W. J. Narroway, W. G. Clough (Hon. Sec.), and two visitors.

MEETING PLACE.—Nearly the whole evening was occupied in discussion with regard to where the members shall meet in the future, and the matter was left unsettled for another meeting to decide—if possible.

Bute, October 2.

Present—Messrs. H. Schroeter (chair), A. Schroeter, J. H. Barnes, W. H. Sharman, W. A. Hamdorf, E. Ebsary, M. Hall, R. Commons, M. Stevens, and A. Sharman (Hon. Sec.).

CONGRESS.—Messrs. Sharman and Ebsary reported on their attendance as delegates, and said they were very much disappointed with the disorderly way in which the business was conducted, especially on the last day.

HAY.—Mr. Barnes said that in America sheaved hay is always stacked in round stacks. Members thought that this was a good way.

Inkerman, October 9.

Present—Messrs. W. Board (chair), C. H. Daniel, J. Lomman, G. Peter, C. E. Daniel, W. A. Hewett (Hon. Sec.), A. Manley (Balaklava Branch), and two visitors.

CONGRESS.—The Chairman reported on proceedings of recent Congress, and answered a number of questions.

SAVING STRAW FOR STOCK.—Mr. E. H. Warren's paper on "Preservation of Fodder" was dealt with, and a long discussion ensued on his advocacy of the Steinwedel straw. Mr. Peter considered the straw from this variety the

poorest of all grown in the district. Mr. Lomman recommended White Tuscan as the best. Mr. Manley said that if the straw were bruised, as in hand thrashing, stock would eat it more readily. It was unanimously agreed that the softest straw procurable is best for fodder, but the best of straw was inferior to wheaten chaff.

LICENSING STALLIONS.—Members do not favor proposal to compel all stallions to be subjected to veterinary examination and licence.

Crystal Brook, October 6.

Present—Messrs. J. C. Symons (chair), J. Bryson, P. Pavy, W. Natt, W. J. Venning, W. Hamlyn, E. Dabinett, A. Hamlyn, W. Morrish, and F. S. Keen (Hon. Sec.).

CONGRESS.—Delegates reported that meetings were very successful, and are of opinion that much good is to be derived from these annual gatherings.

DRILLING MANURES.—Mr. Bryson said he had heard that it is best to drill in manures whilst the weather is dry, and broadcast and harrow in the seed afterwards. Some other members think the best way is to drill in the manure after rain. Mr. Dabinett had drilled some seed a day before the rain and some the day after the same rain. At present the later sown portion stands 6in. higher than that sown the day before rain. Members are agreed that spreading fresh stable manure on bare patches caused by "take-all" is a good remedy.

BLOOD CLOTS IN UDDERS.—These may be caused by cold, or a blow, or by crushing when lying down. The teats should be bathed in warm water and thoroughly milked, else they will go blind.

Johnsburg, October 6.

Present—Messrs. G. H. Dunn (chair), H. Napper, F. W. Hombsch, F. W. Smith, T. Thomas, T. Potter, W. McRitchie, and T. Johnson (Hon. Sec.).

CONGRESS.—Mr. Thomas reported on proceedings of the Annual Congress. He considered the meetings highly successful, but considered the Chairman allowed the delegates too much latitude, several persisting in speaking at the same time, and on several occasions causing considerable confusion.

INDIAN REMOUNTS.—The Hon. Secretary read an article from September issue of *Journal of Agriculture* on this subject. A good discussion followed, members considering the matter worthy of serious consideration, as, owing to the low price of wheat and the frequent bad seasons, many farmers find it very difficult to make ends meet. It was, however, considered doubtful whether this district would be suitable for horse-breeding. It was suggested that with larger holdings it would pay better to devote some attention to the rearing of horses than to growing wheat. Horses from Australia had come in for high praise from the military authorities, and members considered those raised in the bush country of Australia were superior in hardiness to any others. Mating of good roomy mares with a sound blood stallion would give satisfactory results.

FODDER IN SEASONS OF DROUGHT.—A discussion took place on this subject. Members considered it desirable to grow early varieties of wheat. King's Early was mentioned as a suitable variety for hay if cut before the straw gets too hard. A member wished to know whether the bearded varieties were likely to be injurious to horses, and if they ate them as freely as the ordinary wheats. [Professor Lowrie has used bearded wheat for hay for years, and states that

with a little attention to the horses' mouths no injury results. The solid strawed wheat, whether bearded or otherwise, will make superior hay to the ordinary wheats, provided they are not left too late before cutting, but a bearded variety may not necessarily be a good hay wheat.—GEN. SEC.]

SAND IN PLOUGH WHEELS.—Mr. Hombsch showed lynch pin and sand guard for plough wheels, which was considered a very good idea for preventing sand or dust getting in the bearings.

FERTILISERS.—Mr. Thomas reported that he had a few acres of wheat manured with English super. sown broadcast. The crop rapidly outgrew the unmanured portion, but was showing the effects of the hot winds. A member expressed the opinion that the manured crops would suffer more in a dry spell than those unmanured.

Mount Pleasant, October 12.

Present—Messrs. G. Phillis (chair), P. Miller, W. M. Vigar, J. Maxwell, H. Dragemuller, W. Lyddon, F. Thomson, H. A. Giles (Acting Hon. Sec.), and P. Hillam (Port Germein Branch).

STANDARD F.A.Q. BUSHEL OF WHEAT.—Mr. H. A. Giles read a paper on the method of fixing annually the standard average quality and weight of the bushel of South Australian wheat, as follows:—

It is with a feeling of diffidence and trepidation I enter on a subject at present handled exclusively by such an able body of gentlemen of high business standing and commercial integrity as the Chamber of Commerce of South Australia, who fix the value of our wheat for the world's markets. As you are aware, I take a deep interest in South Australian exportable wheat. For over thirty years I have grown from 200 acres to 300 acres of wheat annually, and therefore claim to be a farmer. For the same period I have been a miller and wheatbuyer, giving me some commercial knowledge of the matter, and also a member of this Branch from its inception, April, 1889, giving me a claim to place my crude thoughts before you. In this year of 1900 I regret, and feel sure this regret is generally shared by wheatgrowers especially, and the thinking public generally, that the result of the Conference, held August 3rd last by delegates from the Chamber of Commerce, country millers and wheatbuyers, Central Agricultural Bureau, and the farmers, fully reported in *Journal of Agriculture*, page 123, on the standard bushel, is absolutely nil. We are to continue in the same groove—may be careless in our farming, having for our aim to keep our wheat at 63lbs. per bushel, while the man who grows wheat exceeding that weight is unrewarded for every pound over 63lbs., and the man who grows wheat under 63lbs. is at the tender mercies of the buyer, and our South Australian wheat may continue to be ticketed at Mark Lane, "South Australian wheat, 63lbs. standard," and conclude that Professor Lowrie should leave alone any interference with the standard of wheat. Having expressed my regret at the present position, I am like the man who is in the ditch—I want to get out and help others in a like position. I want all the members of the 107 Branch Bureaus in South Australia to take thought for to-day and to-morrow, and use our lever of union to try and raise our wheat-growing standard higher, and in so doing help the Chamber of Commerce in their present inability. Let us as farmers try what self-reliance can do by co-operation. First—One and all members of the Agricultural Bureau of South Australia set our shoulders to the wheel; directly and indirectly we shall be a strong lever. If all concur, say so through our joint meetings. Secondly—How can we best effect our object? Messrs. Darling & Son have a big control at present of the disposal of South Australian wheat. From the evidence taken at the Congress that firm is silent as to the fixed price they will give for every pound above the average of 63lbs. per bushel and the deductions for every pound under 63lbs. standard. This once and for all should be fixed equitably in the interests of wheatgrowers and wheatbuyers. If we unionise to obtain this result we must wisely choose the best means to secure effect to this. To my mind we may congratulate ourselves on the fact that a very good running channel is ready in which to launch our boat. South Australia possesses a living Co-operative Farmers' Union, of 2,948 members—presumably wheatgrowers—with provision to take with open arms an unlimited number of new members at the minimum cost of membership, worked and controlled by its members, sharing any profits. That for the year ending September 1st, 1900, has dealt with 477,525 bags of wheat, equal to about 2,000,000bush. It is easy to see that the present 1,500 members of the Agricultural Bureau, and 2,948 members of South Aus-

tralian Farmers' Union, a total of 4,448 practical intelligent farmers, would possess sufficient power, wisely used, to remedy existing evils. [But a great number of our members are already members of the South Australian Farmers' Union.—GEN. SEC.]

A very large portion of South Australian wheat must be exported, and it appears to me that Ports Adelaide, Pirie, and Augusta will always be the chief shipping ports, and that properly equipped cleaning and grading plants, with silos for the loose clean wheat, which need not be too costly, could be erected at these ports by the foreshadowed co-operative body to deal with the wheat as soon as possible after delivery at railway stations, and cost of stacking and covering against weather, loss by mice, bleaching and decaying of bags from outside exposure, with occasionally bursting bags at the buying depôts, could annually be saved; and such saving would in a few years pay for the cleaning plants and silos, while the empty bags, which should bear the owners' registered brand, could be returned to the consigning agencies, free of cost, as empty returns. The silos would then contain a mixed wheat from all soils, a true average, and worthy of South Australia, ready for shipment, loose, to be dealt with by elevators should they come in use as in America, or to be bagged in new branded export bags, automatically weighed of one weight, while all impurities removed could be sold at the cleaning depôts whole or ground, or consigned by rail to available markets. Thirty-three years ago my firm erected a similar plant on a small scale, and the saving of bags and wheat (as mice cannot do much harm in a silo of loose wheat), besides giving us a uniform sample from which to draw our daily milling requirements or fill from for sale, convinced us that it was a profitable investment for our small business. I said before, cleaning plants need not be costly; wheat twice put through a Bagshaw winnower in a barn free from any wind becomes a good marketable sample. It is a matter of calculation as to the quantities likely to be daily delivered to any fixed plant fairly easily to be arrived at, and possibly it would be well to offer a prize for the best plan, with estimate of cost for a machine and oil engine (to save room for stacking firewood), to deal with such quantity under proper specifications. Secondly, decide on size and get estimate for silo or silos, convenient to ship, for loose wheat by elevators, or bagged, while the receiving side should have roomy platform for unloading from trucks as it arrived, and immediately be shot into cleaning machine, working night and day if required. Were my suggested plan carried out, South Australian wheat should appear in the world's markets creditably, and would obtain a relatively higher value, to the profit of the shareholders of the union.

I would now like to explain my idea of how wheat should be bought from the grower. Take 63lbs. as a standard of fair quality wheat, and every pound over to be paid for. Thus—A delivers 60bush. of wheat, average 65lbs. per bushel; pay him for 62bush. at the ruling 63lbs. standard price. B delivers 60bush., average 61lbs., but is only paid for 58bush. And this, in my opinion, would be fair to all, and result in better wheat, better cleaned, and absence of dissatisfaction and uncertainty as now exists.

Mr. Davey is reported to have said at the Congress (page 129, *Journal of Agriculture*), "The price of wheat left millers and buyers almost no margin of profit; they were just keeping on to keep their staffs and mills employed." This undesirable state of things should not exist; we farmers should take the burden on our shoulders and release Mr. Davey and his fellow-sufferers. This is my idea of how we may show we want no favors, but will rely on ourselves, and through our co-operation amend defects that may crop up or interfere with the greatest improvement possible to be made with South Australian wheat, and put it on the world's markets second to none. The mixing of wheat of various size in grain from all soils, passed over screens to remove all under a certain size with blowers, and then passed into one common heap, would give a true sample for shipment or milling, and no difficulty arise in disposing of the offal.

In conclusion, I trust this matter will not be allowed to rest, that every man will take it up till the matter is satisfactorily settled, when the union can supply the Chamber of Commerce with samples for like bodies in any part of the world.

Clarendon, October 8.

Present—Messrs J. Spencer (chair), A. Harper, W. Henty, W. Spencer, J. Juers, A. A. Harper, E. Dunmill, J. Chapman, and A. L. Morphet (Hon. Sec.).

DAIRYING — Mr. J. Juers read the following paper:—

In no other industry has there been more rapid changes in recent years than in that of dairying. The machinery and utensils invented a few years ago are being greatly improved, and many are now quite out of date. Inventive minds are constantly at work to improve existing methods. Chemists, bacteriologists, and others skilled in science have given earnest attention to investigating and improving the properties of dairy products. First.—I should like to make a few remarks on cows. The question is which is the most profitable

cow to keep—a good one or a bad one? It is all very well to judge a cow by appearance, but practical men are well aware that ~~many a fine-looking cow is unprofitable for the dairy.~~ At the present time it is fully recognised that there is no way so reliable to tell a good cow from a bad one as a scales and Babcock milk-tester. The average cow in South Australia has the reputation of giving a very small return as compared with the cows of many other countries. Whether this is so or not is open to question, and would be a difficult query to settle definitely. In my opinion South Australia possesses some cows almost as good as are to be found in any part of the world. If bad cows were known for certain, and weeded out, and the remaining cows received better attention, our prospects would be bright indeed in the dairying line. If I were to start a dairy farm I would decidedly get a herd of cross-bred Shorthorn with Jersey. Some of the members present, perhaps, would ask, what do you consider a good cow? I consider a good cow to give 880galls. of milk, producing 350lbs. of butter, averaging $3\frac{1}{2}$ per cent. of butter fat per annum, realising £12 16s. 8d.; that is, taking the average price of milk at $3\frac{1}{2}$ d. per gallon. I should like to give you an instance from a man who has thirty-two cows. The best cow he has gives 697galls. of milk, butter-fat test, 4.2, producing 326 $\frac{1}{2}$ lbs. of butter (at 8d. per lb. he received £10 17s. 7d.); and his worst cow gave 299galls. of milk, butter-fat test, 3.7, making 122lbs. of butter; butter realising 8d. per lb., he received £4 1s. 6d. The average pounds of milk he required to make 1lb. of butter was 24 $\frac{1}{2}$ lbs. The average return of milk per head was 520galls.; of butter, 215 $\frac{1}{2}$ lbs.; and in money, £7 3s. 6d. The return of milk from the best cow was 697galls.; from the ten best, an average of 625galls.; from the ten worst, an average of 390galls.; and from the worst cow, 299galls. The return in money from the best cow is £10 17s. 7d.; from the ten best, an average of £9 3s. 5d.; from the ten worst, an average of £5 4s. 8d.; and from the worst cow, £4 1s. 6d. In order to make my paper more instructive it is assumed that the cost of each cow's keep for a year amounts to £2 10s. and the cost of attention £1 10s. This £4 is estimated to sufficiently provide for rent or interest on the investment for each cow's keep and the labor involved; anything returned over that sum may be looked upon as profit. Therefore the best cow gives a profit of £6 17s. 7d.; the ten best average £5 3s. 5d.; the ten worst average £1 4s. 8d.; and the worst cow a profit of 1s. 6d. The best cow gives over ninety-one times as much profit as the worst one. A bad cow needs just as much to eat and as much attention as a good cow, and gives but very little profit for the labor.

IMPORTED MANURES.—Mr. Harper said he considered the freight charge of 30s. to 40s. per ton on manures from England is too high for profitable use when the price of produce is so low. [How can you alter this state of things? —GEN. SEC.]

• Pine Forest, October 9.

Present—Messrs. R. Barr (chair), W. H. Jettner, W. Kempster, W. C. Cooper, T. Masters (Hon. Sec.), and two visitors.

HARVEST PROSPECTS.—Members estimate that the average yield of wheat within an area of eight miles of the Bews Post Office will be 7bush. per acre, and would have been higher had it not been for the deficiency in the southern and south-western portion of that area. This gratifying indication is ascribed to the general use of fertilisers.

SEED EXPERIMENTS.—The Hon. Secretary reported that Marshall's Hybrid wheat received from Central Bureau for trial was in ear. Part is bearded, but the majority is beardless. Which is the correct type? [The beardless. The others are reversion to the original parentage.—GEN. SEC.]

CONGRESS.—The delegates to the Twelfth Annual Congress of the Agricultural Bureau, held in Adelaide, gave a lengthy report upon the proceedings. [The details were published fully in the October issue of this journal.—GEN. SEC.] The papers were mostly able and judicious, and were discussed volubly, if not always to the point. Whilst the delegates invariably allowed the reader of any paper an audience, few of the critics could secure sufficient order to make themselves heard. . . . This disorder prevented the interchange of ideas and the dissemination of information gained by experience in different parts of the colony. As a consequence, some delegates refrained from taking part in the proceedings, owing to the treatment others received. The chairman seemed

powerless to keep the meetings in hand, and some of us could not help the feeling that a younger and more energetic man should have occupied the position—one with sufficient influence to command respect and insist upon order being maintained. The visit to Islington Workshops was interesting and instructive. At Roseworthy Agricultural College farm the delegates came to the conclusion that superphosphates occupy premier place as fertilisers for our soils. The addition of nitrogenous and potassic manures seemed to be of no benefit whatever. In some places takeall appeared. This the Professor of Agriculture attributed to dry working, and says it is easily preventable. A crop of Calcutta oats excited much admiration. King's Early wheat is considered by the Professor to be the best for hay, and the stripped wheat germinates as readily as that which has been reaped and thrashed. All visitors were much pleased and interested in what they saw and heard, and agreed that the Professor is the right man in the right place.

REWARD FOR THE DISCOVERY OF PHOSPHATES.

Office of the Minister of Education and Agriculture,
Adelaide, January 20, 1900.

Rewards are hereby offered for the discovery and working within the colony of a deposit or deposits of marketable mineral manure, as under:—

1. £500 if found on Crown lands; £250 if found on freehold lands.
2. If found on Crown lands, the discoverer will be entitled to a lease of the land upon which the discovery is made, in terms of Part VI. of the Crown Lands Act of 1888, providing for a lease of 640 acres for twenty-one years.
3. The above rewards will be payable to the discoverer at the Treasury, Adelaide, on the certificate of the Professor of Agriculture that the following conditions have been complied with:—
 1. That the deposit is easily accessible, and within a reasonable distance of a railway or seaport, and not within twenty-five miles of any discovery on account of which any bonus has been paid.
 2. That the deposit is sufficiently abundant, and is available at a price which will allow of it being remuneratively used for agricultural purposes.
 3. That the product is of a good marketable quality, averaging not less than 40 per cent. of phosphate of lime, provided, however, should a phosphate of a lower average composition be discovered, the Professor of Agriculture may recommend that a portion of the reward be granted.
4. The terms of payment will be $\frac{1}{5}$ (one-fifth) on the production of the first 200 tons; the remaining $\frac{4}{5}$ (four-fifths) to be paid, $\frac{1}{5}$ (one-fifth) on production of each additional 200 tons.

Applications, addressed to the Minister of Agriculture, Adelaide, will be received up to and including the 31st day of December, 1902.

E. L. BATCHELOR, Minister of Agriculture.

CURING HAMS.—The following is a good recipe for curing hams, instead of smoking them. It is taken from an old-fashioned recipe-book, by a Dr. Chase:—For 100lbs. of ham, take coarse salt, 8lbs.; saltpetre, 2ozs.; brown sugar, 2lbs.; potash, 1½ozs.; water, 4galls. Saleratus, 2ozs., may be substituted for the potash. Pour over the meat. In three to five weeks the meat has a flavor considered by many superior to that cured by smoking.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of October, 1900 :—

Adelaide	0·64	Hoyleton	0·58	Macclesfield	1·38
Hawker	0·28	Balaklava	0·49	Meadows	1·68
Craddock	0·22	Port Wakefield	0·49	Strathalbyn	0·97
Wilson	0·24	Saddlesworth	0·72	Callington	0·44
Quorn	0·38	Marrabel	0·78	Langhorne's Bridge..	0·62
Port Germein	0·50	Riverton	0·83	Milang	0·78
Port Pirie	0·39	Tarlee	0·66	Walleroo	0·39
Crystal Brook	0·53	Stockport	0·69	Kadina	0·45
Port Broughton	0·35	Hamley Bridge	0·61	Moonta	0·46
Bute	0·45	Kapunda	0·83	Green's Plains	0·45
Hammond	0·30	Freeling	0·68	Maitland	0·63
Bruce	0·24	Stockwell	0·96	Ardrossan	0·47
Wilmington	0·65	Nuriootpa	0·98	Port Victoria	0·35
Melrose	0·51	Angaston	0·81	Curramulka	0·58
Booleroo Centre	0·33	Tanunda	1·21	Minlaton	0·54
Wirrabara	0·65	Lyndoch	1·20	Stansbury	0·53
Appila	0·50	Mallala	0·78	Warooka	0·62
Laura	0·69	Roseworthy	0·64	Yorketown	0·60
Caltowie	0·93	Gawler	1·04	Edithburgh	0·64
Jamestown	0·64	Smithfield	0·62	Fowler's Bay	0·30
Gladstone	0·53	Two Wells	0·76	Streaky Bay	0·33
Georgetown	0·58	Virginia	0·76	Port Elliot	0·15
Narridy	0·56	Salisbury	0·84	Port Lincoln	0·33
Redhill	0·57	Teatree Gully	1·45	Cowell	0·48
Koolunga	0·55	Magill	0·97	Queenscliffe	0·43
Carrieton	0·23	Mitcham	0·99	Port Elliot	0·87
Eurelia	0·42	Crafers	2·03	Goolwa	0·63
Black Rock	0·19	Clarendon	1·79	Meningie	0·70
Orroroo	0·32	Morphett Vale	0·93	Kingston	1·25
Johnburgh	0·19	Noarlunga	0·75	Robe	1·01
Petersburg	0·23	Willunga	0·95	Beachport	1·05
Yongala	0·24	Aldinga	0·34	Bordertown	0·67
Terowie	0·32	Normanville	1·08	Wolseley	0·57
Yarcowie	0·27	Yankalilla	1·01	Frances	0·85
Hallett	0·53	Eudunda	0·65	Naracoorte	1·20
Mount Bryan	—	Truro	1·00	Lucindale	1·03
Burra	0·80	Mount Pleasant	1·23	Penola	1·61
Snowtown	0·56	Blumberg	1·53	Millicent	1·95
Brinkworth	0·46	Gumeracha	2·19	Mount Gambier ...	2·02
Blyth	0·46	Lobethal	2·06	Wellington	0·78
Clare	0·73	Woodside	1·62	Murray Bridge	0·67
Mintaro Central	0·69	Hahndorf	2·15	Mannum	0·35
Watervale	1·42	Nairne	1·38	Morgan	0·31
Auburn	0·91	Mount Barker	1·41	Overland Corner....	0·34
Manoora	0·66	Echunga	1·65	Renmark	0·08



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY

(C. C. CORNISH, SECRETARY).

Labor Bureau.

Number of Persons Registered, and found Employment by Government Departments and Private Employers, from September 28 to October 29, 1900.

Number Registered.			Number found Employment.
Trade or Calling.	Central Bureau.	Country Agencies.	
Laborers and youth laborers	56	169	316
Carpenters	4	4	6
Plasterers	—	—	1
Painters and improver	—	1	1
Blacksmiths	—	2	—
Boilermakers and assistants ..	—	1	2
Fitters and turners	6	3	15
Moulders	3	—	2
Cleaners and glut cleaners	19	15	13
Carriage washers and junior porters	43	16	8
Apprentices	15	—	—
Rivet boys	4	—	4
Farm hands	—	—	3
Bakers	3	—	1
Carriage-trimmers	—	—	3
Enginedrivers	1	1	2
Master mariners	—	3	1
Shipwrights	—	—	1
Attendants	2	—	1
Chainmen	—	—	1
Stonebreakers	—	—	4
Gardeners	—	—	1
Bullock driver	—	—	1
Totals	156	215	387

October 30, 1900.

A. RICHARDSON, Bureau Clerk.

General View of the English Factories Acts.

CONTRIBUTED BY INSPECTOR BANNIGAN.

(Continued from page 319.)

EMPLOYMENT.

A.—General.

The meaning of "employment" in the Acts is minutely laid down. It includes work in a factory or workshop, whether for wages or not, either

- (a) in a manufacturing process or handicraft; or
- (b) in cleaning any place used for such process or handicraft; or
- (c) in cleaning or oiling any part of the machinery; or
- (d) in connection with the process or handicraft, or with the article made or otherwise dealt with.

The Acts do not apply to employment in a factory or workshop for the sole purpose of repairing the premises or the machinery, nor to the process of gutting, salting, and packing fish immediately upon its arrival in the fishing boats, nor to the process of cleaning and preparing fruit between June and September, to prevent it from spoiling, immediately upon its arrival in a factory or workshop.

There is a presumption (until the contrary is proved) that a person found in a factory or workshop is employed there, except at meal times, or (in a factory) when the machinery is stopped, or while bringing food between 4 and 5 p.m. to the persons employed. But this presumption does not apply to open yards, nor to rooms in which no work is done, nor to domestic workshops.

The provisions which determine the length and conditions of employment in factories and workshops apply to three classes of persons employed—children, young persons, and women. Children are persons under 14 years of age; young persons are male and female persons between 14 and 18 years of age; a female young person becomes a woman within the meaning of the Acts on reaching 18 years of age.

Children, young persons, and women may be employed in any factory or workshop subject to the following limitations:—No child under 11 may be employed in any factory or workshop; no child, young person, or woman may be employed in a factory or workshop on Sunday, except in the case where both employer and employed are of the Jewish religion; no woman may be employed in a factory or workshop within four weeks after childbirth. In certain specially dangerous processes the employment of the children and young persons is prohibited, and in any dangerous occupation, for which special rules are made under the Act of 1891, the employment of any class of persons (including male adults) may in future be either restricted or prohibited by the special rules.

Definite periods of employment are fixed for each of these classes of persons in textile factories, non-textile factories, and workshops, and (subject to the exceptions presently mentioned) it is an offence punishable by fine to employ any of them outside of the period fixed for them. The exceptions allowed to this rule are of two kinds. In some cases an alteration may be made in the hours of labor, but so that the total length of the period is not increased. In other cases additional hours (called overtime) may be worked, except on Saturday. The extent of both kinds of exceptions, the factories and workshops to which they apply, and the conditions on which they are allowed, are minutely determined in the Acts. In very many cases the Secretary of State has power to add to the lists of factories and workshops to which the exceptions apply, by an order published in the *Gazette* and laid before Parliament, the order being revocable by the Secretary of State. Wherever an exception of this kind is allowed, either by the Acts themselves or under an order, the Secretary of State may, by a similar order, impose conditions relating to cleanliness, ventilation, or (in the case of night work) to hours of employment. The general periods of employment, and the particular exceptions of both kinds which are allowed, are specified in detail under the heads of the classes of workers to whom they relate.

Special exceptions with regard to Saturday and Sunday work are made in favor of a Jewish occupier of a factory or workshop. If he keeps his premises closed on Saturday till sunset, he may employ young persons and women from sunset to 9 p.m. If he keeps his premises closed both before and after sunset, he may add on an hour at the beginning or end of the ordinary period for young persons and women employed by him on every other day in the week, but the additional hour must be between 6 a.m. and 9 p.m. Further, as regards the young persons and women employed by him who are also of the Jewish religion, he may employ them on Sunday if he keeps his premises entirely

closed on Saturday. In this case either Sunday or Friday must take the place of Saturday as far as concerns the period of employment, and the factory or workshop must not be open for traffic on Sunday.

The sections which fix the periods of employment for the different classes of workers require fixed intervals for meals to be allowed during the periods. The actual time of the meal hours may in general be fixed by the employer. The meal hours must be the same for all children, young persons, and women employed in a factory or workshop, except in certain specified classes of works, the list of which the Secretary of State has power to extend. During the meal hours no child, young person, or woman may be employed in a factory or workshop, or remain in a room where work is carried on, except in certain specified classes of works, the list of which the Secretary of State has power to extend. Further, there are certain parts of certain specified factories and workshops in which no child, young person, or woman may take a meal or remain during meal hours, even if no work is being carried on there. No child, young person, or woman may be employed continuously for more than four and a half hours in a textile factory, or for more than five hours in a non-textile factory or a workshop without an interval of at least half an hour for a meal; but this rule does not apply to women employed in a workshop conducted on the principle of not employing young persons or children. Certain specified textile factories are for the purpose of this last-mentioned rule put on the same footing as non-textile factories from November to March, if the period of employment begins at 7 a.m. and the first hour of the period is allowed for meals.

In every factory or workshop the occupier must affix a notice showing the period of employment and the meal hours for his factory or workshop, as well as the system on which children are employed. A change may not be made in the period, meal hours, or system so specified until notice has been sent to the inspector and affixed in the factory or workshop, and may not be made oftener than once in a quarter, unless for special cause approved in writing by the inspector.

An occupier of a factory or workshop who proposes to avail himself of any special exception, by which the period of employment may be either altered or extended, must serve notice of his intention on the inspector seven days in advance. He must also (except in cases of domestic workshops) affix a similar notice in the factory or workshop seven days in advance, and keep the notice affixed during the period of the exceptional employment. The notice must specify the proposed hours of employment and the proposed times for meals. Before 8 p.m. on each day of overtime employment the occupiers must report to the inspector particulars of the employment. He must also enter similar particulars in a register, and affix a notice containing them in the factory or workshop. If he fails in his duty with regard to any of these notices, reports, and registers the special exception will not protect him.

Employment inside or outside a workshop on the same day in the business of the factory or workshop is now subject to certain restrictions, from which the Secretary of State has power to exempt any particular trades, either generally or in particular localities. Such employment is absolutely prohibited in the case of a child, except during the recognised period of employment. It is prohibited in the case of a young person or woman (except during the recognised period) on any day on which the young person is employed inside the factory or workshop both before and after the dinner hour. To prevent evasions it is provided that a person is deemed to be employed outside a factory or workshop on any day on which work is given out to him, or taken out by him, to be done outside. Further, in the case of a young person or a woman employed by the same employer, both in a factory or workshop and in a shop, the total period of

employment on any day may not exceed that permitted in the factory or workshop. A similar limitation of hours of employment is imposed by the Shop Hours Act, 1892, in the case of a child or young person (though not in the case of a woman) who is employed in any shop, and who to the knowledge of the shopkeeper has already on the same day been employed in a factory or workshop.

PERIOD OF EMPLOYMENT FOR YOUNG PERSONS

A.—Ordinary Period.

In textile factories—

Six a.m. to 6 p.m., or 7 a.m. to 7 p.m., with two hours (of which one hour is before 3 p.m.) for meals. On Saturday, 6 a.m. to 12.30 p.m. for manufacturing purposes, and to 1 p.m. for other purposes; or (if not less than one hour is allowed for meals) 6 a.m. to 1 p.m. for manufacturing purposes, and to 1.30 p.m. for other purposes; or from 7 a.m. to 1.30 p.m. for manufacturing purposes, or 2 p.m. for other purposes, with at least half an hour for meals in any case.

In non-textile factories or workshops—

Six a.m. to 6 p.m., 7 a.m. to 7 p.m., or 8 a.m. to 8 p.m., with one and a half hours (of which one hour is before 3 p.m.) for meals. On Saturday, 6 a.m. to 2 p.m., 7 a.m. to 3 p.m., or 8 a.m. to 4 p.m., with half an hour for meals. (In a non-textile factory or a workshop Saturday employment may be from 6 a.m. to 4 p.m., with two hours for meals for a young person who has not been employed for more than eight hours on any day in the week, if notice of the non-employment has been affixed in the factory or workshop and served on the Inspector.)

In domestic workshops—

Six a.m. to 9 p.m., with four and a half hours for meals. On Saturday, 6 a.m. to 4 p.m., with two and a half hours for meals.

B.—Alteration of Hours.

In any non-textile factories and workshops which may be specified in an order by the Secretary of State, the period for young persons may be from 9 a.m. to 9 p.m.

In the process of Turkey-red dyeing, Saturday employment may be till 4.30 p.m., if the additional hours have already been deducted on some day or days in the same week.

Male young persons over 16 may be employed in lace factories between 4 a.m. and 10 p.m., with nine hours for absence and meals, and in bakehouses between 5 a.m. and 9 p.m., with seven hours for absence and meals, provided in both cases that no such person may be employed both before and after the ordinary period on the same day, nor after the ordinary period on one day and before it on the next.

The Secretary of State has power (which he has not at present exercised) to order that male young persons over 16 may be employed in bakehouses as if they were adults, either generally or in any particular district.

In printing works where newspapers are printed, on not more than two nights in a week male young persons over 16 may be employed at night (i.e., between 9 p.m. and 6 a.m.) as if they were adults, but not for more than twelve consecutive hours, nor on more than two nights in a week.

Employment of male young persons at night is allowed in certain specified works, the list of which the Secretary of State has power to extend, but only so as to affect male young persons over 16. This exception only authorises employment on a process incidental to the business of the factory. Persons employed by virtue of this exception may be employed during a period of not more than twelve consecutive hours altogether, which period must be specified

in a notice, and they must have similar meal hours to those which are compulsory by day. They must not be employed during the preceding or following twelve hours, and must not be employed by virtue of this exception on more than six nights, or in blast furnaces or paper mills seven nights in any two weeks. Young persons to whom this exception applies may also be employed on an alternative system, namely, in three shifts of eight hours each, with an interval of two unemployed shifts between each two employed shifts. Since January 1st. 1897, this exception has applied only to male young persons over 14, i.e., not to children over 13 who, having obtained certificates of proficiency or of previous attendance at school, may be employed as young persons.

In glass works a male young person may be employed according to the accustomed hours of the works on certain conditions. The total period in a week must not exceed sixty hours. The periods must not exceed fourteen hours each in four turns per week, or twelve hours each in five turns, or ten hours each in six turns, or they may be any less number of hours in the accustomed number of turns, but so that there may not be more than nine turns altogether in a week. After each turn of employment there must be an interval of at least one unemployed turn. Employment must not continue for more than five hours without an interval of half an hour for a meal. This exception does not authorise employment on Sunday.

C.— Overtime.

Overtime employment of young persons (as distinguished from mere alteration of the hours of work) is allowed in three cases only.

In certain specified non-textile factories and workshops a young person may be employed at the end of a day's work for an extra half hour in order to complete an incomplete process, but on condition that any such extra half hours must be deducted from the total period for the week.

When there is danger of damage from spontaneous combustion in Turkey red drying, or from any extraordinary atmospheric influence in open-air bleaching, a young person may be employed overtime to prevent the damage.

In factories driven by water power, and liable to be stopped by drought or flood, the Secretary of State may authorise the employment of young persons from 6 a.m. to 7 p.m., with intervals for meal hours, on days other than Saturday. This overtime must not be worked where the danger is from drought on more than ninety-six days, or where the danger is from floods on more than forty-eight days in any year. It must not extend beyond the time already lost during the previous twelve months.

What Work Is.

We lived on the face of the earth a long time without any knowledge of geography (said Charlotte Perkins Stetson in a recent essay of the above title). We lived in the human body a long time without any knowledge of physiology. We have lived for a long time in the daily performance of those large industries by which society is maintained without any knowledge of social economics. And, just as we believed strange myths about the earth and about the body before knowledge came to dispel superstition, so we have believed strange myths about work.

Work is the social process, the economic basis of all human life, a word of supremely human significance. Men work and make their cattle work, but a free and independent lower animal does not work. He expends energy in the pursuit of his dinner, but we do not call it working. The only sub-human creatures we call workers are the ant, the bee, and the beaver. They exert

themselves not each for each, not merely parent for child, but all for all. They have common interests and make a common effort to serve those interests, with the result of developing a high degree of prosperity, and also of ability and intelligence—they work.

We now begin to see what work is. It is not an individual process, but a collective one. It involves division of labor and exchange of products. It is something you do for others, while others do something for you. It is practical, profitable altruism.

It is most distinctively human, because human interests are most interdependent. We cannot be human at all without common effort for the common good. We cannot be human without work.

The very first step in social development required some sort of exchange of labor; and every step upward has brought with it wider dependence on each other. The first and most essential feature of work is this mutualism, and, growing naturally from that, the second division is of labor. People who can only do the same thing, and do it equally well, are still benefited by working together; but there soon results a greater benefit. As the work is divided—part given to one and part to another—the man who does one thing continually develops a special skill in that line; and we begin to enjoy the fruits of that second distinction of human work—specialisation. It has its danger of excess, of course, as have all natural tendencies when not balanced by others; but within right limits it is a most valuable factor in work.

The human animal enters upon his line of social development with this new law upon him, that his individual interest is best served by his serving the interest of others, and that the common interest is best served by an increasing degree of specialisation in labor. It is here that the organic nature of our social relations becomes plainly apparent, and work is shown to be a distinctively social function.

The confusing features in its orderly development are not difficult to account for. Our social functions are strangely interfered with while we fail to understand the principles of sociology. We overestimate some, underestimate others, and miscastimate nearly all, because we do not know the laws of the game.

Social evolution steadily forces us on, making us do that which is necessary for social progress whether we know it or not, but as far as our individual grasp of the subject goes we have blundered most gravely. This immense and basic process of social life—work—is obscured in our minds by centuries of falsehood and prejudice.

It is apparent to anyone that the mere existence of society depends on work, that the nature of a given society depends on the progress of its work; and also that the individual finds his best happiness in his best work, his worst punishment in uncongenial, forced labor, or that last horror—forced idleness; and in the face of these facts we still “labor under a misconception.”

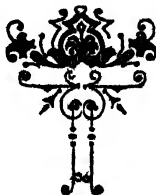
Our main error is in thinking that work is done to gratify our own desires—see the “want theory” in existing systems of economics. No expression of energy of sufficiently high grade to be called “work” is done to gratify oneself. In its very nature as work it is done for someone else. The individual may be led to do it by self-interest, drawn into the social service through his sub-social desires; but the work is for others. We are urged to seek food through the irritation of an empty stomach called appetite, but the processes of nutrition are not for the gratification of appetite, but for the nourishment of the body. The appetite is only a means to an end. We unconsciously recognise the social duty involved in work by honoring the man who is faithful to his task even to his own disadvantage. What we call “honesty” in the workman and “honor” in the soldier are really the same thing—faithful service to society.

If work were done for individual ends, why should we not impose on one another? It is because of our false notion that it is a personal matter, done for personal gratification, that we see everywhere the private interest working against the common interest, and the world is clogged and injured by bad work; and it is because of this same false notion—that work is something you do for yourself, and would not do if you did not have to—that we so foolishly misjudge work and the worker.

Another radical error as to the nature of work comes from our view of life as a condition of reception. We think the pleasure of living is in receiving sensations—a most mistaken and limited idea. The main pleasures of life come through expression rather than impression. Supplied with every conceivable means of gratification, a human being soon exhausts the pleasure of having things; but, given right avenues to employ his energies, he never exhausts the pleasure of doing things. The receiving power of an organism is not so great as its giving power. Expression is greater than impression. We fondly imagine that it is better to have things than to do them. Acting under this mistake we seek to avoid work and look down upon the worker.

The first human laborer was the slave, and most reluctantly did he enter upon his social duties—only the fear of death drove him to it. The master, despising the slave, as naturally despised his condition. Later, in the period of feudalism, when labor was performed by the serfs who belonged to the soil, the noble lord who headed the little state, protecting the peasant while the peasant fed him, despised the humble serf, and considered fighting noble and working base. As economic processes of society have grown, and widened, and become dominant the fighter has become relatively less valuable and the worker more valuable. The power to make and distribute things is more important to-day than the power to destroy them; the vital strength of modern society is in its productive, not in its destructive, processes.

But our mental concepts are always behind our conditions. Our opinions of work and workers still rest on the feudal idea, and back of that on the more primitive slave idea. This is pure prejudice, needing honest recognition as such, and forcible ejection from the human mind. We all see something of the value of work in its material products; but that value rises immeasurably as we study the effect of our material environment upon human character and progress. We all see something of the good effect of true work upon the workers, the ill effect of wrong work or overwork, but we do not begin to see how closely our personal happiness, health, and growth depend on our doing our own right work. But the dominant fact—the organic social nature of work—we have scarcely more than dreamed of; that it is an essential function of social life and progress, and that not to work is not to be a member of society.



Journal of Agriculture

AND

Industry.

No. 5. REGISTERED AS]

DECEMBER, 1900.

[A NEWSPAPER. VOL. IV.

NOTES AND COMMENTS.

November has proved decidedly cooler than usual for this season of the year. About the middle of the month nice showers fell over the greater portion of the wheat-growing areas, helping many of the later crops to fill out. The stripper is proving that the dry weather of October has not done so much injury as was feared, though complaints of pinched grain are not uncommon. The hay crop generally has been good, very heavy crops being cut in many districts. The area cut for hay will probably be larger than usual. Fruit crops generally promise to be good; trees and vines on the whole are vigorous and healthy. The soaking rains of August last have had a very beneficial effect on both orchards and vineyards.

- - - - -

Mr. W. J. Allen, Government Horticultural Instructor for New South Wales, has given the actual cost for labor and material (exclusive of original cost of tents) involved in fumigating 275 fruit trees in an ordinary orchard with hydrocyanic acid gas. The work occupied two whole days for three men at 6s. per day each, 715½ozs. cyanide of potassium at 1d. per ounce, and a like quantity of sulphuric acid at 2d. per pound. The total cost was £5 3s., and the average cost per tree was 4½d. Eight tents were in use, but had there been more the cost could have been reduced, as the men had to wait until some of the tents became free for use. The largest tent was 16ft. high and 34ft. circumference. Not a single scale or insect was left alive upon either of the trees, and the fruit afterwards was perfectly free from scales.

- - - - -

Excessively fat meat is not profitable to the butcher nor to the consumer, and this fact is becoming more and more apparent every year. For this reason it behoves those who are rearing fat lambs for export to consider which breed or crossbreed will give the finest-shaped carcass, with a good proportion of lean meat. The pure Shropshire and Shropshire-Merino cross, or the Oxford Down and its cross with Merino apparently fulfil these requirements. It is fortunate that we have a fair proportion of pure Shropshires in the colony.

- - - - -

From Miss Eleanor A. Ormerod, LL.D., F.R. Met. Soc., F.E.S., &c., we have received an early copy of a most useful work on "Flies Injurious to Stock," with life histories and means of prevention of a few kinds commonly injurious. This is issued at a time peculiarly appropriate to South Australian conditions, in view of the recent advent of the horse botfly (*Gastrophilus equi*),

about the proper name and description of which there has been a little friendly discussion. Miss Ormerod very properly deprecates the practice of misnaming or indiscriminately applying one name to several distinct and dissimilar insects. The "gadflies," "breezeflies," and "horseflies" (various species of *Tabanidæ*) are bloodsuckers, and the maggots live amongst decaying vegetation on the ground. The name "botfly" is applied indiscriminately to *Gastrophilus equi*, which lives during its maggot stage in the stomach of the horse, and to *Hypoderma bovis*, the maggot of which lives in tumors (called "warbles") in the skin of cattle. The flies treated upon in this work are sheep's nostril fly (*Oestrus ovinus*); sheep "tick," or spider-fly (*Melophagus ovinus*); horse botfly (*Gastrophilus equi*); forest-fly (*Hippobosca equina*); seven species of gadflies or breezeflies (*Tabanus*); the horse warble-fly (? *Hypoderma loiseti*); and the ox warble-fly (*Hypoderma bovis*).

In Natal several farmers use light rails for tram and steam traffic on their farms; and it is stated that not less than 175 miles of track, with rails 12ft. to 20ft. are laid on gauges varying from 18in. to 30in. Most of these lines are portable, and are just laid temporarily where most required. Where animals are used the 12lb. rail has proved most suitable. For heavier work, and where steam is used, 16lb. and 20lb. rails are laid. It is found that 12lb. rails will carry a wheel-pressure of 1,630lbs. with sleepers at 2½ft. apart, and 1,430lbs. at 3ft. apart, whilst 16lb. rails can bear a wheel-pressure of 2,360lbs. with sleepers at 2½ft. apart, and 2,050lbs. at 3ft. apart. A six-wheeled vehicle exerts less pressure on a given length of rail than is exerted by a four-wheeled one. Very much more work can be done by a certain number of animals on a tramline than can be done in the same time by the same—or a great many more—animals working on natural roads, or in the fields.

The editor has, during the past twenty years, persistently advocated surface stirring of the soil wherever any kind of crop is grown. The finely-pulverised soil is an almost perfect preventive of evaporation of moisture from below, and at night it promotes absorption of moisture from the air. Where anyone walks on the loosened surface the soil becomes somewhat solidified, and at every foot-step the soil will soon become very dry beneath. For this reason the rake or hoe should be used to loosen and pulverise those spots. During the hottest weather, if one opens the dust-covered soil in such a garden, orchard, vineyard, or field of "cultivated" green fodder it will be found to be quite damp at a depth of 3in. Directly the surface becomes caked from any cause it should be worked into a loose condition at once, else extensive evaporation will be the result.

Cows in some parts of the colony become weak in the hind quarters, and after a short time die. If removed in good time (when symptoms first appear) to a distance they generally recover. In some cases the owners feed some bonedust with beneficial results, but it would be safer to boil the bonedust first as there is some danger of introduction of tuberculosis. It appears to have been conclusively proven that anthrax was introduced on some farms in New Zealand, and there are rumors of tuberculosis resulting from the use of raw bonedust as a fertiliser. When bones are converted into superphosphate the cooking of the bones to extract the grease and the use of sulphuric acid to dissolve the bones effectually destroys all germs of disease. If bonedust is to be fed to animals it should be first boiled, and the finer the bones are ground the more benefit will be derived from the application.

There is no doubt concerning the beneficial influence of lime—either mild or caustic or unslacked—to many classes of soils under certain conditions. For instance, peaty soils, newly reclaimed, are sweetened; heavy clay soils are lightened and made friable; even sandy soils may be improved.

The capacity of any soil to produce any particular crop is governed by the scarcity of any one ingredient necessary for the maturation of the plants. There may be a great superabundance of phosphates and of nitrates, but if potash is deficient the crop will be poor. So if potash is plentiful and phosphate deficient the same result will follow. Each ingredient required by a plant must be available, else no good crop can possibly be produced.

Owing to the long-continued drought in our North and in Queensland and New South Wales the supply of beef and mutton will, for some time to come, be extremely limited. For this reason the value of pork and poultry will certainly make it profitable to breed pigs and rear fowls. It will probably pay better to feed these animals with wheat and barley at 3s. per bushel than to cart it to the agencies.

Mr. J. Dermond, Government Veterinary Inspector, has discovered beef measles in a piece of beef sent to him for examination. The disease appeared in the form of small hard lumps from the size of a pin's head up to that of a grain of wheat. These lumps, or cysts, contain minute worms which are filled with eggs, and these eggs cause tapeworm in man. When meat is found to be affected with these worms it should be effectually burned or boiled down—not buried, because by this means the disease may be spread. The cysts to the number of 300 have been found in a pound of beef. All officers and others are requested to watch vigilantly for suspicious cases in beef, and to send samples if necessary to Mr. Dermond. It is recorded as a fact that beef measles was discovered in two old beasts about two years ago by Mr. W. C. Quinnell, Veterinary Surgeon to the Department of Agriculture of Queensland, and another case was reported as occurring near Mount Gambier some time back. If this disease is extremely contagious it is strange that other cases have not been discovered.

The Chairman of the Central Agricultural Bureau (Mr. F. Krichauff, Stacey Street, Norwood) is desirous that members of Branches shall observe and report to himself or to the Central Bureau the effects of commercial fertilisers applied to pastures, especially in respect to the healthfulness and thriftiness of sheep and the increased number that can be carried per acre where the rainfall does not fall below an average of 12in. per annum, giving the names and quantities of manures applied. The importance of this information can best be estimated from a perusal of the following figures:—From 1893 till 1899 the export of wool from Australia was 2,111,863,834lbs., containing 380,135,484lbs. of nitrogen, equal to about 1,697,000 tons of blood manure. The potash contained in the grease of the wool was about 12,672,000lbs., equal to 45,265 tons of kainit. During the above period 46,088,677 sheep and 1,009,187 lambs were exported, containing 56,507,616lbs. of nitrogen, equal to 252,363 tons of blood manure, and the phosphate of lime in the above animals was 70,634,514lbs.,

equal to about 70,073 tons of bonemeal. [In the above figures allowance may have to be made for a considerable deficiency of grease in wool raised on poor dry areas. The wool in such cases is dry, thin, hard, and hairlike. It would also be interesting to know the area of land from whence the wool, sheep, and lambs came.—ED.]

It is beyond all dispute that some kinds of birds inflict damages to a greater or lesser extent upon fruit, grain, and vegetable crops, whilst a few go further and attack poultry, eggs, and young lambs, &c. A very few species of birds do very much more harm than good; but in the case of the great majority of land birds the rule ought to be strictly observed that "the laborer is worthy of his hire." The damage done to crops and produce of all kinds by insects and similar pests amounts to probably 10 per cent. of the total annual value, but would be reduced to less than 1 per cent. if everyone were well enough informed to recognise the yeoman service rendered by the carnivorous and insectivorous birds, and would protect instead of destroy them wholesale as they do.

Many years ago the "sacred thistle" (*Carduus Marianus*) was declared "noxious within the meaning of the Act," and much friction was excited and large sums of money expended in an effort to eradicate it. Later on a severe drought occurred, and starving stock took to eating it, thus saving their lives and even maintaining some sort of condition on the food. Because of this fact there has been keen opposition on the part of many people to the inclusion of any other weed under the provisions of the Noxious Weeds Act, and the sacred thistle has been the only lever they could trust to aid them in their efforts. Very few landowners, nevertheless, would hail with pleasure the exclusion of all other herbage on their own lands through the presence of the sacred thistle or any other weed. Rational consideration should approve of the prompt extermination of any weed which is proved to be poisonous or utterly useless, and likely to overrun the colony.

BROOM CORN.

BY JAMES T. ROBERTSON, M.A.

The cultivation of this plant for commerce has barely begun among us. In all Australia last year there was only about 60 tons produced. It grows luxuriantly in meadow land, river flats, and reclaimed swamps, and also in sandy or loamy soils outside the influence of creek or river; but in the latter the fibre is shorter and finer. The yield of fibre is from 8cwts. to 15cwts. per acre, according to the class of country, and of seed about half a ton. A good price for the fibre is £25 a ton, and for seed £12. Last year a grower in Gippsland, Victoria, got £50 a ton for the fibre off seventy acres, and £12 a ton for some 40 tons of seed. The seed is rich food for stock, pigs, poultry, &c.

The following are directions for growing:—

1. The seed should be put in in early spring, and may be sown up to November in late districts.
2. The ground must be finely worked up and clean.
3. The seed is sown in drills 3ft. apart, 4in. deep and thick (*i.e.* from $\frac{1}{2}$ in. to 1 in. in the drill), about 7lbs. to 8lbs. to the acre.
4. The drills should then be lightly rolled over.
5. As soon as the crop appears a scarifier should be run between the drills and close up to the plants.

6. When the plants are about 3in. high the weaker plants should be thinned out by hand or hoe, so as to leave the plants about 3in. or 4in. apart.

7. When the plants are 6in. high the drills should be hilled, all weeds being at the same time removed.

8. From this time until maturity the scarifier should be run through the rows when it is thought necessary. The broom takes from fourteen to seventeen weeks to mature.

9. When the seed is full but not quite ripe each stalk is cut with a knife about 6in. below the fibre. When the fibre is short it is well to cut a longer stalk. It is found to be quite unnecessary to bend the heads some time before cutting, and is only a waste of labor.

10. The heads thus cut are then dried, either (1) by spreading them out in the open air, 3in. or 4in. deep, on a layer of broom stalks to keep them off the ground, and another layer of stalks on the top of them, or (2) by taking them at once into sheds away from risks of rain and setting them on racks, or in any other way drying them that may be found convenient and economical. The heaps should be turned occasionally during the process of drying. It is important to retain a pale-green color; it informs that the fibre is tough. Here beauty is the handmaid of utility.

11. When the fibre is dried the seed is removed by a simple machine, costing a few pounds, which can be worked by hand or horse power.

12. The fibre thus dried and cleansed is classified according to length, pressed in bales, and sent to market.

13. If the seed has been sown fairly early a second crop can always be taken. This second crop matures in about six weeks.

DIE-BACK DISEASE OF APRICOTS.

BY E. M. SAGE, PINERY.

In 1886 I planted sixty apricot trees on the top of a sandhill, which, without manures would not produce 2bush. of wheat per acre. The trees were planted 20ft. x 20ft. and grew well for a time, commencing to bear at four years old. They bore heavily every year, sometimes as much as five to six cases per tree being gathered. From 2galls to 4galls of half-grown fruits have been picked from a tree owing to the heavy setting. When the trees were about nine years old some of the limbs were fully two weeks later in starting into growth than others on the same trees. The following year the limbs commenced to die back, in some cases for 2ft. or 3ft. from the ends, and in others one or two limbs would die nearly out, the rest of the tree being apparently quite healthy. At first I attributed the trouble to overheating or sunburn, but on examining the trees it was noticeable that while one tree was affected on the sunny side, the next was the reverse.

In thinking the matter over and having in mind the marked result of the application of phosphates to wheat-impooverished land, it occurred to me that lack of plant food was at the root of the trouble. Three years ago I cut all the trees back to about 3ft. from the first fork and applied local bone superphosphate in varying quantities, from 1cwt. to 7cwts. per acre, in different parts, leaving some trees untreated. The manure was sown evenly on the surface and ploughed in. The first year, owing to the dry season, and to the super. being coarse and only partially soluble in water, little improvement was noticeable, but the next season those receiving the heavier dressings began to make a decided improvement, and last year they grew as well as ever, as will be seen from the accompanying illustration.



BLOCK 1.—SHOWING ONE YEAR'S GROWTH ON MANURED APRICOT TREES
AFTER BEING CUT BACK.

This limb is taken from a tree in the middle of a row of sixteen trees treated with varying quantities of manure. Those receiving most have made the greatest growth; those unmanured or only lightly manured have mostly died. None of those heavily manured were lost. The centre illustration represents the growth last year, which on many of the trees is from 4ft. to 5ft. in length, and, as will be seen from the smaller illustrations, the buds are well developed and numerous. This year's growth is strong and healthy, and there is a splendid setting of fruit. The trees in question are Moorpark on apricot stocks. Oullin's Early and Newcastle Early appear to stand better than the Moorpark.

In the second illustration is about a foot of old stem from an unmanured tree—the only one left—showing the dead twigs and the poor growths made



2 1
BLOCK 2.—NO. 1 IS BRANCH FROM UNMANURED TREE SHOWING PRESENT
AND PAST SEASON'S GROWTH. NO. 2 SHOWS PRESENT SEASON'S GROWTH
FROM MANURED TREE IN ADJOINING ROW.

last year, and the 2in. or 3in. of the present season's growth. Alongside is a shoot from a tree in the next row which was manured. The contrast is too striking to need further comment.

In my opinion apricot or other trees that bear well when young should in our lighter and drier districts be dressed with 2cwts. to 3cwts. per acre of superphosphates each year after the sixth or seventh from planting. I have used potash and nitrogenous manures on a small scale, but cannot see any benefit from them. They are too expensive at present to be used by the hundredweight. Had I used a wholly soluble phosphate I believe the results would have been quicker and more satisfactory, as even at the present time particles of undissolved bone can be picked up on the surface after a strong breeze. I may mention that our average rainfall is only about 15in., and sometimes as low as 10in., and the soil gets ploughed once in winter, summer cultivation being impossible as the land would drift badly. Several other instances of the beneficial effect of phosphatic dressing to trees suffering similarly have come under my notice, and I am convinced that much of the so-called disease known as "die-back" in fruit trees could be prevented or cured by the judicious application of phosphatic manures.

[Memo. by Inspector of Fertilisers.—The local superphosphate used by Mr. Sage contains only about 14 per cent. of water soluble phosphate and about 20 per cent. of reverted and insoluble phosphate, besides being rather coarse. The finely-ground mineral super. containing 36 per cent. of water soluble phosphate would be very much quicker in its effects, especially in such a dry district, and also much cheaper.]

MANURING OF POTATOES.

In connection with the West of Scotland Agricultural College some very instructive experiments in the manuring of potatoes have during the past three years been carried out on a number of farms in the West of Scotland, and a report of the experiments has recently been published by Professor Wright.

The following conclusions have been drawn from the results of these experiments :—

Large and good crops of potatoes can be successfully grown either with farmyard manure alone, or with artificial manures alone, or with a combination of farmyard manure and artificials.

The amount of increase produced by manures on the potato varies greatly according to the variety grown. In these experiments the Up-to-Date potato gave a much larger return than the Maincrop for the manures applied.

A much greater increase in crop was obtained for each ton of farmyard manure applied when the manure was given in moderate quantity (10 tons per acre) than when it was given in a full dressing of 20 tons per acre.

A still greater increase of crop, and a much more profitable return, was obtained for each ton of farmyard manure applied, when it was given in moderate quantity (10 tons per acre) along with suitable artificials than when it was applied alone either in large or in small quantity.

Potatoes grown on farmyard manure alone were deteriorated in nutritive value and in cooking quality.

Less injury was done to the quality by small dressings (10 tons per acre) of farmyard manure than by large dressings (20 tons per acre).

A proper combination or artificial manures applied to the potato crop, either alone or with a half-dressing of farmyard manure, gave a large and a profitable increase in crop.

Potatoes of higher nutritive value and of better cooking quality were grown

on a half-dressing of farmyard manure, with suitable artificials added, than on a full dressing of farmyard manure alone.

Artificials added to a full dressing of farmyard manure were much less effective, and produced much less increase of crop than when added to a half dressing.

The best potatoes in nutritive value and in cooking quality obtained in the experiment were grown on artificial manures alone.

Potatoes grown with artificial alone suffered more readily from drought on light soils than where farmyard manure had also been given. The safest and best method of manuring the potato crop is to use both.

In the artificial manures applied along with farmyard manure the quantity of potash found most effective and profitable was that contained in $1\frac{1}{2}$ cwts. sulphate of potash of 97 per cent. purity.

Kainit, whether applied with farmyard manure or with artificials alone, proved less effective in increasing the crop than either sulphate of potash or muriate of potash.

The potatoes grown on kainit were also distinctly inferior in nutritive value and in cooking quality to those grown on sulphate of potash or muriate of potash.

When applied with farmyard manure and other artificials, muriate of potash produced a larger increase of crop than sulphate of potash, and proved itself to be the most profitable potash salt to use with farmyard manure.

When applied with farmyard manure the nutritive value of the potatoes grown on muriate of potash was somewhat inferior to that of those grown on sulphate of potash, but there was no apparent inferiority in cooking qualities.

When the crop was grown with artificial manures alone sulphate of potash gave a larger produce and a more profitable return than either muriate of potash or kainit, and produced potatoes much superior both in nutritive value and in cooking quality.

Nitrate of soda applied with artificial manures alone at the rate of 1 cwt. per acre, and put on as a top-dressing immediately after the first weeding of the crop, exercised no deleterious influence on the quality of the potato.

The heaviest average yield of large potatoes was obtained from plots manured with 20 tons farmyard manure, 4 cwts. super., 1 cwt. sulphate of potash, and 1 cwt. sulphate of ammonia, the returns averaging 5 tons $4\frac{1}{2}$ cwts. The plots manured with 10 tons farmyard manure, 4 cwts. super., 1 cwt. sulphate ammonia, and 702 lbs. kainit (equal to $1\frac{1}{2}$ cwts. sulphate of potash) averaged only 1 cwt. per acre less; consequently were more profitable. The same quantities of manures, except the substitution of $1\frac{1}{2}$ cwts. sulphate of potash for the kainit, averaged 5 tons, 2 cwts. of large potatoes per acre. None of the plots where only artificial fertilisers were used came within 9 cwts. per acre of the mixtures of farmyard and artificial mentioned.

MYLOR TYPICAL ORCHARD.

On Saturday, November 24, the Board of Governors of the Botanic Garden, together with several members of Parliament and a few visitors, inspected the typical orchard at Mylor. The party consisted of Dr. M. Holtze (Director), Sir Samuel J. Way, Bart., the Hons. E. L. Batchelor (Minister of Education), C. C. Kingston, G. McGregor, A. M. Simpson, Major J. W. Castine, M.P., and Messrs. T. H. Brooker (chairman), L. von Doussa, A. H. Peake, J. Hutchison, C. M. R. Dumas, T. Price, and D. McKenzie (members of Parliament), and Messrs. W. C. Grasby and A. Molineux (member and General Secretary of the Agricultural Bureau respectively). Three years ago the land

here was natural forest, with very large trees, a deal of undergrowth, and considerable rock on the surface, but the soil beneath was not stony. A photograph taken directly after the trees and scrub had been removed shows an almost hopeless mass of rock; but it has been carted off, and a deep, poor, sandy soil remains, but it is studded with fruit trees of hundreds of different varieties, true to name as far as present means of comparison and identification will permit, and planted in the most perfect manner on a system under which it is absolutely impossible that any errors can be made in locating each individual tree under the name in which it was first received and in the locality in which it has been planted. Each tree and plant has its label with number, name, person from whom received, date of planting, and other particulars on it, and additionally there are three separate books, in as many different localities, recording the same particulars, so that if all the labels were removed it would still be easy to replace them, or if any of the books were destroyed the necessary information could be recovered either from the one source or the other. The orchard comprises twenty acres, and contains 5,000 fruit trees and about 3,000 small fruit-bearing bushes &c. It is, of course, a certainty that duplication exists amongst the numerous supposedly distinctly-named varieties, but in time, when the trees begin to bear fruits, these duplicates will be detected, and the proper names substituted for the wrong ones.

It may be worth while to controvert an absurd idea that has been prevalent in some quarters that it is intended to use this orchard in competition with market gardeners. With scarcely two varieties alike and a very large number of them next to useless it would not be possible to market the fruits with any advantage. But, on the contrary, the fruitgrowers will be able to compare their probably wrongly-named fruits with others that are correctly identified; they will be able to observe the work, character, nature, and peculiarities of each variety, and the whole orchard will become a valuable object lesson, illustrating what can be done with our extensive "inheritance in the hills." The trees and plants have been introduced from England, France, Germany, and our Australasian colonies, and comprise the following 3,430 varieties, each group of three being supposed to be different from all of the others:—Apples, 1,135; pears, 706; plums, 285; peaches, 251; nectarines, 64; apricots, 104; cherries, 184; quinces, 22; persimmons, 25; almonds, 29; figs, 69; citrus fruits, 52; chestnuts, 6; walnuts, 6; olives, 8; mulberries, 7; medlars, 3; loquats, 2; nuts, 32; raspberries, 43; blackberries, 26; currants, 64; gooseberries, 82; grape vines, 106; strawberries, 120. Since the commencement of this orchard the total expenditure has been £2,429 18s. 7d., spent in the following manner:—Labor, £1,705 18s. 3d.; materials, tools, &c., £373 14s. 4d.; plants, £192 9s. 1d.; superintendence and sundries (including £50 proportion of the director's salary), £157 16s. 11d. No manure and no water has been applied to any of the trees or plants. The growth has not been phenomenal, owing to the poor nature of the soil; but, considering that the trees have not yet become acclimatised, the growth is highly satisfactory and their health all that can be desired, and not more than 2 per cent. of the whole have failed. Of course there was a luncheon, and a remarkable decision was arrived at, namely, that there should be no speechifying; but nearly every member of the party was called upon and talked for a shorter or longer time—mostly longer. Fortunately the reporters had gone off to admire the strawberries, and no record exists of what was said.

TO PRESERVE WOODEN LABELS.—Thoroughly soak the wood in a strong solution of sulphate of iron, and then lay them out to dry. Afterwards lay the labels in limewater for a time. This causes the formation of sulphate of lime (a very insoluble salt) in the wood.

THE DISEASES OF WINES.

BY ARTHUR J. PERKINS, GOVERNMENT VITICULTURIST.

(Paper read before the S.A. Winegrowers' Association on November 28, 1900.)

I.

Introductory.

To be possessed of generous elasticity is one of the chief characteristics of a living language; with the expansion of knowledge and the genesis of new lines of thought it will open out to the reception of newly-coined terms, or sanction the broadening of others that in the past had covered a narrower range of thought. Clearness and freedom from ambiguity being, however, the essence of correctly-expressed thought, it is incumbent on those who avail themselves of these licences to clearly define at the outset what it is that they would convey. In this connection I would first draw your attention to the meaning we attach to the word "disease" as applied to wines. When in common parlance we say that an "animal" or "plant" is affected by disease, our meaning does not admit of misconstruction. Are we justified in extending the term to a substance devoid of life, such as "wine"? And granting that in doing so we are not offending against the ordinary canons of language and common sense, what phenomena may the word be legitimately made to cover? I believe that Louis Pasteur was largely responsible for this extended meaning of the word, which we have simply adopted as an equivalent for the French "*maladie*." He was led to study wines that were abnormal and defective in their general characters and composition, and found that these deviations from the normal sound type were due in most cases to the development in the wines of various parasitic micro-organisms. Subsequently and within recent years, as you are no doubt aware, to the active agency of these invisible germs have been traced back the initiating causes of many long-known phenomena, behind which in the past their presence had not even been suspected. Ailments of animals and plants that had previously been looked upon as ordinary constitutional disorders were recognised as being the natural consequence of the presence of the ubiquitous bacterium. And nowadays most of the ills to which flesh and plant life are heirs would appear to be more or less connected with some sort of parasitism. Betwixt the ailments of beings endowed with life and what may be called the accidental unsoundness of wines there would appear therefore to exist sufficiently striking parallelism to justify their inclusion in one and the same term, "disease." Disease, however, in its original sense covers more than disorders purely parasitic in their nature. With wines does there exist a corresponding equivalent? In other words, can other defects in wines, arising not from parasitism, but from careless manipulation, defective initial composition, accidental causes, &c., be termed diseases? I think not; and it is in its more restricted meaning, including alone cases of proved parasitism, that I shall use the word here.

Origin and Causes of Disease.

The originating causes of these diseases interest us not a little, for wine, not being endowed with the recuperating powers of life, can in no sense ever be described as recovering from the attacks of parasitic germs. Curative treatment is of little avail; preventive treatment can alone ensure its wellbeing, and the efficacy of the latter is evidently largely bound up with a correct knowledge of the starting point of the ailment. From whence come these micro-organisms

which, according to a prominent South Australian winemaker, are yearly responsible for the loss of thousands of gallons of wine in the colony? From whence come the weeds that invade our crops, our orchards, our vineyards? From those plants that during previous years we have allowed to go to seed, I trow; and a similar answer can with equal justice be given to the former question. Success in wine-making, more particularly under our warm climate, under the genial influence of which weeds of all sorts flourish luxuriantly, is mainly dependent on the most scrupulous attention to minutiae and detail—an attention that must come as second nature to all those who have to do with the handling of wines, from the cellar manager to the ordinary cellar hand, and an attention that, I fear, has not hitherto become sufficiently engrafted on to our natural carelessness. It is not a matter of ignorance. We are perfectly well aware of what in all such matters is the strictly correct procedure. The many failures of the past have further brought home to us the penalties of neglect and carelessness. Habit, however, occasionally supported by accidental success, has a power of inertia all its own; and impenitent we apathetically go on our way rejoicing. This much I know—however strong and correct our convictions in this direction, so long as we fail to justify them by our actions, so long shall we have to mourn over the loss of thousands of gallons of wine.

Without for the present attempting to follow up in detail individual instances of infection and disease, but merely treating the matter in broad outline, so as to include in comprehensive scheme all that is known on the subject, I will discuss the origin and causes of disease under the following headings:—

- I.—Neglect of General Cleanliness.
- II.—Carelessness of Manipulation.
- III.—Defective Original Fermentation.
- IV.—Defective General Composition of the Wine.

I.—Neglect of General Cleanliness.

This point cannot be too strongly insisted upon; it should be uppermost in the winemaker's mind from the day he first plans out his cellars to the day he lies down in his grave. In this connection faulty original design is frequently the cause of much of the trouble. It is hardly an exaggeration to say that there are few of our cellars, particularly the older ones, that do not open their arms wide to every germ of disease; and under the circumstances it is not so much the quantity of wine that is spoilt that should come as a matter of surprise as the large amount of really good wine that is still produced every year. One of the surest and best methods of screening wines from disease of any sort may be summed up in the possession of a clean cellar, clean casks, clean utensils, clean surroundings. A dirty untidy cellar is a veritable hotbed of disease, and within its precincts it is only fortuitously that all but the most robust of wines can escape some measure of serious contamination. At certain seasons of the year—during the vintage, for instance—the most careful of us cannot avoid introducing into the cellars numerous disease germs; with the yeast cells they come to us on the grapes themselves. These, however, by the observance of scrupulous cleanliness and careful and rational manipulation, we can gradually eliminate from the young wines; in dirty cellars they come to stay. And more, every wind that blows, every person that enters the premises, may at any time prove an accidental source of infection; the latter, however, can make no headway unless it find in our cellars congenial ground for development. I would not for a moment imply that a good cellar cannot be other than an elaborate architectural edifice. Wine-making is, after all, an ordinary commercial enterprise, the ultimate success of which must be shown on the balance-sheet. Simplicity of structure, however, in no wise precludes the possibility of scrupulous attention to cleanliness, nor need it hinder the appli-

cation of correct processes of manufacture. What additional and otherwise superfluous adornment is given to a cellar can only be excused on the ground of prospective advantages to be derived by a striking form of advertisement, a question that need hardly occupy us here. However much I might desire it, a full discussion on the details of cellar construction can hardly be conciliated with the avowed object of these papers; nevertheless I would miss my main object did I not in this connection call attention to what, given our firm and settled beliefs, I may be permitted to call the glaring inconsistencies of our general practice. Above all things a cellar should be well ventilated. In the composition of the atmosphere of all cellars there generally enters an undue proportion of carbon dioxide, and with bad ventilation it becomes stagnant and foul. There is no better purifier than fresh wholesome air, and the latter should be encouraged to circulate freely about the premises. In our anxiety for low temperature this is an important point that we often omit to take into consideration, and yet the two are surely not incompatible. Again, how many of our cellars are so paved as to render possible the thorough cleansing of the floors? How many of us disinfect our walls with periodical coats of whitewash? How many of us scrub the woodwork so that no traces of spilt wine or must can prove future sources of danger?

Further, not only the internal arrangements of the cellar itself, but also its immediate surroundings, should be innocent of all matter in more or less advanced stages of decomposition, offering to obnoxious germs convenient stepping stones to the wines within. I have seen stables, with their inevitable manure heaps, built within hand reach of cellars; I have seen at the cellar doors accumulated in careless disorder the skins and stalks of a previous vintage long after the month of March. In the end such things cannot but tell against the wines.

Of still greater importance is the care and attention that is bestowed on all that portion of the cellar plant that comes in immediate contact with the wine. Fermenting vats, casks, presses, pumps, hoses, &c., are they always thoroughly cleansed and disinfected as they should be? I have a distinct recollection of being asked whether fermentation would not set right a sour cask; perhaps so, but what of the wine that helped to cleanse it? A wine that is judged to be off is racked into a new cask; the cask that originally held it, after a more or less perfunctory rinsing, is now made to receive an unquestionably sound wine. What are the chances of the latter in a few weeks' time? Wines, young wines in particular, throw down a heavy deposit of tartar that adheres to the wood in rough irregular layers; the latter, under the influence of temperature variations and imperfect cleansing, open out in numberless crevices that readily give shelter to germs and organic particles liable to putrefaction. There are few that go to the trouble of regularly removing this deposit, and yet to a delicate wine such neglect may at any time be of serious consequence.

I have dwelt at some length on this question of cleanliness—not more so than its importance demands; nay, perhaps insufficiently and too superficially when we consider the hundreds of ways in which, taking it as a primary principle in wine-making, it is daily sinned against. Carelessness in this respect I believe to be at the root of nine-tenths of the troubles of our cellars. It is absolutely useless to adduce in justification of an evidently unsatisfactory state of affairs the example of many old European cellars. In many of them the law of cleanliness may be more honored in the breach than the observance. It is certainly not so in the more modern and better conducted ones; nor have we means of ascertaining the amount of wine that is yearly spoilt in those that might appear to justify our own shortcomings. And finally, without wishing to infer that under colder climates cleanliness is merely an optional matter, I would repeat that under our warmer latitudes any neglect of it is followed by results far more serious and certain.

II.—Carelessness of Manipulation.

Under this heading I include all errors of omission or commission, of ignorance or carelessness, affecting the various technical operations to which wines are subjected, and which under certain conditions may initiate or accentuate a diseased state. Here I can give little more than a simple enumeration of such points as have come under my personal observation; any lengthy digression or amplification of them, however interesting, would take us beyond the province of our subject matter.

Sufficient attention is not always paid to the filling up of casks; such neglect opens the door to ærobic germs that live on the surface of the liquid. I have known casks left to stand six weeks on ullage; what the condition of the wine was may be left to your imaginations. At all times casks must be carefully watched, relieved of their excess when hot winds blow from the north, and speedily replenished as soon as weather conditions change. Silent fermentation once terminated, no important ullage should ever be allowed to form in a cask. This implies the very frequent examination of casks, far more frequent than usually prevails. The straight upright vats, with flat heads, such as are in use in some of our cellars, are in this respect, unless in constant communication with an independent reservoir, absolutely useless as storage vessels; however level they may be set they cannot possibly be kept full.

Insufficient racking favors the development of disease. Wines are often left too long in contact with their gross lees; in the latter disease germs abound; given favorable conditions they develop and ruin the wine. Young wines should be racked at least four times during the course of the year, older wines once or twice according to circumstances, and every wine in the cellar in the spring before the return of warm weather. Racking in too open contact with the air is another source of danger.

Wines are fined at unsuitable times of the year. The fining does not take; it remains in suspension or in semi-solution, favoring the development of parasitic germs. At other times fining or filtering is neglected when the application of one or the other operation would have saved the wine. Owing to the exigencies of the market or short vintages, imperfectly-matured wines, wines that have not yet thrown down their organic sediment or floating germs, are put up for sale; the wine goes wrong and is returned, &c. And thus examples might be multiplied *ad infinitum*: the results are always the same, and the causes—neglect, carelessness, ignorance, or an unhealthy hopefulness that the individual case might always prove the exception that proves the dimly-recognised rule.

III.—Defective Original Fermentation.

It may well be said that during the course of fermentation are laid down the foundations of a wine. Whatever the care and attention that is subsequently bestowed upon it, whatever the treatment it is subsequently made to go through, a badly-fermented wine will always remain a more or less unsound and diseased wine; a well-fermented wine, on the other hand, has a future before it that only some accidental occurrence or the carelessness of those who have the subsequent handling of it can possibly mar. Fermentation therefore evidently forms a question of considerable importance; beyond, however, pointing out its connection with the origin and development of disease in general, we cannot further dilate on it here. In the first place it may be pointed out that many, if not all, of the diseases may find their starting point in the fermenting vat. In order to fully appreciate this fact we must thoroughly possess ourselves of the idea that on the grape skins and the stalks, side by side with the yeast cells, can be found germs of every form of disease to which wines are liable; that with the crushed fruit we introduce the latter into our

vats; and that, should opportunity arise, they will attack the must or wine. It is further a recognised principle in wine-making that so long as the yeast is in full healthy growth it is able to crowd out all minor germs and save the wine from the taint of their parasitism. Weakness, or unhealthy growth, forms the opportunity of these disease germs, and they are not slow to take advantage of it. If, therefore, at any time fermentation languishes, the wine is in danger; if it is long in starting the danger is almost equally great. So long, however, as general external conditions favor the development of the yeast the wine can suffer no harm. What, from this point of view, constitute favorable conditions most of you know; at all events I cannot enter into a description of them here. Bad, incomplete fermentation does not necessarily imply the development of disease germs within the vat; occasionally a wine may leave the vat perfectly sound though badly fermented. This same wine, however, unless receiving special treatment to be referred to in the sequel, and treated with the utmost care, will at any future time be liable to the attacks of disease.

IV.—Defective General Composition of the Wine.

As amongst human beings certain individuals, through weakness of constitution, are more liable to disease than others; so it is with wines. Certain wines are naturally robust, and defy the carelessness of the most careless wine-maker; others again are delicate, weakly, and fall a ready prey to disease. What is it in wines that in this sense constitutes constitution? That is the question that we have now to consider.

In wines chemical analysis constantly reveals the presence in varying proportions of certain compounds possessed of more or less highly marked antiseptic properties. Those calling for more especial notice may, placed in order of their practical effectiveness, be enumerated as follows:—(1) Ethyl alcohol, (2) a special form of tannin generally known as œno-tannin, and (3) free fixed acids and acid salts, the principal of which is cream of tartar. In view of the fact that these several substances tend to convert a wine into a medium ill suited to the development of parasitic micro-organisms, the higher the proportions in which they are present the less likely is the wine to succumb to disease, or, in other words, the stronger its constitution. As tending to neutralise the desirable antiseptic action of the abovenamed substances by rendering the wine at all events habitable to hostile germs, if not encouraging their presence there and therefore as exercising a counteracting and debilitating action on its constitution, chemical analysis further reveals the occasional presence of other substances such as sugar, soluble or semi-soluble albuminous matter, gelatinous matter, pectic bodies, soluble ferments, &c. Largely depending therefore, as it does, on the presence or absence of certain compounds, on the relative proportion present of others, the determination of the liability of a wine to disease, of the relative robustness or weakness of its constitution, forms a question of perhaps unusual complexity. When present in abnormal proportions, after heavy fortifying for instance, the antiseptic compounds, by rendering the liquid totally unfit to the vegetation of any micro-organism whatsoever, may occasionally bring about its complete and permanent sterilisation, thus putting it beyond the reach of any disease as here understood. It would be difficult, perhaps impossible, to definitely fix the minimum limits at which such results could be obtained; these compounds act conjointly and not separately, and accordingly as a wine contains more of one it requires less of another to give rise to perfect sterilisation. Whereas, for instance, 15 per cent. or 16 per cent. of alcohol might perfectly sterilise a wine rich in tannin, it might not have similar effects on another wine showing only traces of the latter substance. In this connection must also be taken into consideration the presence or absence of those other substances, already referred to, hurtful to the wine and helpful

to the parasites seeking to take possession of it. Notwithstanding these difficulties, and providing a sufficient amount of elasticity be allowed to the figures given, average limits covering the majority of ordinary cases may still be established in a fairly satisfactory manner.

Adverting to alcohol first, as the most important of the antiseptic substances, we may state that although liquids containing as much as 15 and 16 per cent. of alcohol cannot be looked upon as wholly and permanently sterilised, nevertheless experience has shown that dry wines containing not more than 12 to 15 per cent. may generally be looked upon as of fairly robust nature, though not necessarily immune from all disease. Sugar being a source of considerable danger, with sweet wines the limit has to be raised. A sweet wine cannot be looked upon as really robust unless containing at least 15 per cent. of alcohol, and sometimes as much as 20 per cent. Here *inter alia* might be remarked that a wholly sterile liquid cannot be obtained by natural fermentation alone, for in the liquid in which the yeast cells were able to live other germs will be able to do likewise. From what I have been led to say on the subject I would not have it thought that I am an advocate of unduly strong wines; my opinions and likes point in a totally opposite direction. Beyond increasing the intoxicating and keeping properties of the liquid, I see no other advantages in high alcoholic percentages; nor do I favor the indiscriminate fortifying very much in vogue here a few years ago. Excepting for sweet or fruity wines, I look upon fortifying as the refuge of the slovenly maker; through carelessness it may at times become necessary. True art consists in so arranging matters as to render it unnecessary; this can and must be done. All the higher class wines of repute are of low alcoholic strength; their inherent delicacy follows as a natural consequence, and to their handling must be brought a skill and attention not often prevalent here.

Though we may have reason to complain of the periodical reappearance of diseased wines in our cellars, we can hardly attribute it to an insufficiency of alcohol in our wines. From numerous analyses made in my laboratory the average alcoholic strength of our dry red wines would appear to vary between 13 and 14 per cent. This, as will be seen in the table appended below, is in excess of the averages for dry reds in most other countries.

Average Alcoholic Strength of Dry Wines.

Locality.	Alcoholic Strength. Per cent.	Locality.	Alcoholic Strength. Per cent.
France (as a whole)	10·2	Herault (red)	10·1
Champagne	11·5	Bordeaux (red)	10·2
Alsace (red)	11·1	Algeria (red)	12
Alsace (white)	10·2	Spain (red)	13
Burgundy (red)	11·5	Italy (red)	12
Burgundy (Chablis)	9·2	Rhine (white)	11·5
Beaujolais	9·6	South Australia (red)	13·6

Of the effects of ceno-tannin on the keeping qualities of the liquid it is not possible to give figures nearly as definite, partly owing to the somewhat chaotic state in which chemistry has hitherto left those complex substances known as tannins, and partly because general wine research has not followed out as closely as alcohol the more obscure and perhaps less useful tannin. Of this much, however, we have the certitude, that a wine that is deficient in this substance, unless unusually rich in alcohol, is very liable to disease. White wines offer us a good illustration of this fact; compared with red wines they are relatively poor in tannin, and with equal alcoholic strength notoriously more delicate than the latter. In this respect the action of tannin may perhaps be described as only indirectly antiseptic; it acts more as a purifier of the wine than as a substance having direct toxic influence over micro-organisms. It

brings about the rapid precipitation of albuminous matters which otherwise, to the great detriment of the wine, would become an easy prey to disease germs. Roughly speaking, a wine containing less than 1 gram of tannin to the litre, unless its alcoholic strength attain at least to 13 per cent., must be looked upon as delicate and liable to disease. I have not to hand a sufficiency of data to render possible any comparison of our wines with those of other countries, so far as their richness in this special substance is concerned; in view, however, of the more complete and rapid ripening of the fruit that obtains under warm climates and the consequent intensifying of the respiratory function, it is my impression that our wines contain perhaps less tannin than those made under colder latitudes.

That a general acidity of the medium hinders the growth of certain forms of micro-organisms has repeatedly been shown by bacteriological research; such is the case with that of some inducing specific forms of disease in wines. It follows, therefore, that a wine with a pronounced acid reaction—this acidity being due not to volatile acids, but to fixed acids and acid salts—it follows that such a wine is better able to withstand the attacks of certain forms of disease than a wine with feeble acid reaction; and in this sense such a wine is of more robust constitution. Here, however, as in the case of alcohol, constitution is not the only point that we have to bear in mind; whatever the benefits to be derived from excess of acidity, we must beware of offending the palates of our customers. So long as the natural acidity of the wine is such as to impart to it a pleasant freshness of taste we may take every advantage of it in the interests of the keeping qualities of our wines; when, however, it oversteps these limits and acquires distinct tartness, with perhaps a slight tendency to set on edge the teeth of the unfortunate buyer, we must perforce stop and risk the consequences. For dry wines an acidity equivalent to 3 grams or 4 grams of sulphuric acid to the litre cannot be looked upon as excessive; for sweet or fruity wines, in which softness and mellowness are points of considerable importance, these figures will have to be still further reduced. Here, however, what is lost in constitution on one side is amply compensated on the other by high alcoholic strength.

The presence of sugar in a wine is, as has already been seen, always a source of danger. It is a substance readily attacked by various forms of bacteria, and in this sense it tends to weaken the constitution of the wine. A wine containing appreciable quantities of sugar must therefore be correspondingly rich in those other components endowed with antiseptic properties; hence sweet or fruity wines are usually very rich in alcohol, and, notwithstanding the sugar, correspondingly robust. On the other hand, no wine, however dry to the palate, is absolutely free from sugar, or rather from substances capable of reducing copper salts; of such substances 1 gram to the litre must be looked upon as a maximum for wines reputedly dry and of average alcoholic strength, anything in excess of this limit renders the wine delicate and liable to disease.

Under warm, dry climates albuminous matters are rare in well-made wines. In years of wet vintages or after exceptionally wet summers they might perhaps make their appearance in poor wines grown on low-lying flats; they might, further, at any time be accidentally introduced into the wine by overfining.

They are more common in white than red wines, in view of the poverty in tannin of the former. Whatever the cause of their presence there, they must always be looked upon as considerably weakening the constitution of the wine in which they may be found.

Pectic substances are fairly abundant in the early stages of manufacture, but tend to disappear in the sequel. I have, however, noted their presence in bottled wine, incontestable evidence of too early bottling. So long as they are present they help to weaken a wine.

In the above paragraphs I have endeavored to show briefly what elements in the composition of a wine formed its reserve of strength and health, and what tended to weaken it and render it more readily open to the attacks of parasites. We may now pass on to an examination of the more general symptoms of the various forms of disease.

General Symptoms of Disease.

In wines, as in the human body, the diseased state is always characterised by definite chemical changes occurring in the body of the liquid; old compounds are destroyed, new ones formed, and the stable equilibrium originally existing betwixt the different component parts is broken up. Whatever the disease, the affected wine becomes what is technically known as unsound. These chemical changes, initiated by bacterial vital energy and resulting in unsoundness, become outwardly and visibly perceptible to the senses of the experienced maker in certain general features that reproduce themselves in all forms of disease. Like a careful examination of the pulse of the patient, that of these characteristic features unfailingly yields unmistakable indications of the state of health of the wine, even in the earliest stages of decline. It is not my object just at present to sketch out the lines on which might be established a correct diagnosis of the several forms of disease that give rise to unsoundness in wines. The discussion of this question I must leave to subsequent papers, in which each form of known wine ailment will receive separate and detailed study. Here I wish merely to show that to those experienced in the handling of wines an exact knowledge of the etiology of a disease and the intimate chemical changes resulting therefrom is not of absolute necessity—that their general training, if well grounded, should be sufficient to enable them to detect even incipient unsoundness, and, as a consequence, to avert by careful treatment its disastrous effects. To my mind the possession of such knowledge is a matter of very considerable importance; and if I insist upon this aspect of the question now it is because not once, but on scores of occasions it has been brought home to me that it has not yet become common property in all our cellars. The chemical changes attendant on all forms of disease are of too complex and far-reaching a nature to leave us any hope of ever being able to restore to its original condition an unsound wine; consequently, as curative treatment must always perforce remain ineffective, and as disease is at all times a possible contingency, measures having for object its prevention must necessarily form part of the daily cellar routine; and, further, since such preventive measures as experience has shown to be necessary may be said to act with equal force against all forms of disease, whilst a knowledge of the actual nature of a disease and its complicated consequences becomes almost of secondary importance, the capability of discerning the first signs of falling off from normal health should and must form part of the mental acquirements of all who would be successful in the handling of wines. It is on this account that I wish to examine in detail these symptoms that distinguish the ailing from the healthy wine.

Looked at from this point of view, it may be said that evidences of the unsoundness of a wine may be gathered from an examination of the following points, the value of which goes in ascending ratio until the fifth and last may be looked upon as an almost infallible index:—

- I.—The General Condition of the Wine.
- II.—The Aspect and Nature of the Color of the Wine.
- III.—The Peculiarities of the Nosc of the Wine.
- IV.—The Taste of the Wine.
- V.—An Examination of the Volatile Acidity of the Wine.

Taken individually and alone these several points, excepting perhaps the last, do not necessarily definitely establish the soundness or unsoundness of the wine; taken, however, *seriatim* and as a body, they can leave no shadow of doubt in the minds of those who, having acquired experience, are not wilfully blind. Let us examine each incriminating point separately, and endeavor to establish what amount of value may be ascribed to their independent and collective evidence.

I.—Condition.

It comes within elementary knowledge that every wine should at earliest possible date after the initial stages of manufacture be freed from all matters in suspension, and acquire clearness and brightness, or what we are agreed to call good condition. Although it does not in all cases follow that a wine that within the prescribed limit of time fails to acquire necessary brightness, or even that one that has exchanged its earlier brightness for a more or less opaque turbid garb, is invariably unsound, or even merely on the way to unsoundness, yet poor condition, particularly if obstinately persistent, must bring any wine under suspicion—suspicion that can either be substantiated or nullified by further and closer examination. And it may be confidently added that although good condition does not at all times absolutely guarantee the soundness of a wine, yet, whatever their condition at any special moment, all unsound wines have at some time or other suffered somewhat, generally to a considerable extent, in condition—a state from which they very rarely completely recover.

There are several factors contributing towards rendering unsatisfactory the condition of an unsound wine; some of these we may proceed to examine. In the first place, during the development of some special forms of disease the liquid may become so impregnated with the millions of these microscopic beings as to impart to it a distinct cloudiness, readily perceptible to the naked eye. Such a wine, in spite of its indisputable unsoundness, may in the course of time become perfectly bright. In time the multiplication of the micro-organisms becomes too great for the medium that supports them, the liquid becomes overstocked, and by bringing about the complete destruction of the materials from which they drew nourishment they may be said to literally eat themselves out. Subsequently under the influence of rest, and in virtue of their weight, they gradually find their way down to the bottom of the cask or the side of the bottle, and the condition of the supernatant unsound wine may in the course of time become beyond reproach. Similar results may also be obtained by the application of various antiseptic treatments to be referred to hereafter. Such facts, however, cannot bring deception to the maker who watches his wines.

Other forms of disease may be characterised by the generation of a certain amount of gas; the latter after traversing the body of the liquid breaks on its surface in intermittent bubbles. A distinctly marked motion sets up throughout the wine, disturbing the lees and causing them to ascend towards the surface; hence another source of turbidity for unsound wines.

Again the chemical disturbances characteristic of some diseases are frequently responsible for important changes in the very nature and physical properties of the liquid; its dissolving power, for instance, may be considerably reduced, and what was originally held in more or less stable solution may now take the form of an amorphous precipitate, tending to tarnish the brightness of the wine, or from the decomposition of the original soluble compounds of the wine there may arise new bodies of less soluble nature, and with like results to the wine. Details of these chemical phenomena, varying as they do with each different form of disease, need not detain us at present; it will suffice our purpose to note that disease may force from the natural elements of the wine insoluble

matter that will remain in suspension or only partial solution, and effectually ruin its original condition. Lack of condition arising from such a source will continue for a period of time that will vary, first, according as the process of precipitation is sudden, almost immediate, or according as it is a slow but continuous process; and, second, according as the precipitate is of high or low specific gravity, or according as it presents itself in a coarse or fine state of division.

To sum up, we know that there are several factors combining to render more or less turbid wines that are unsound or about to become unsound. In consequence all wines the condition of which remains poor are liable to suspicion, and must be carefully watched.

II.—Color.

An examination of the color of a wine often yields valuable indications as to its state of health. Here again, however, as in the case of condition, such evidence as may be derived from it taken alone cannot possibly be looked upon as conclusive. Wines unsound to the core may at times show magnificent color, whilst perfectly sound wines frequently lack it. In this connection the color of a wine may be examined from two different points of view—(1) as to its brightness, (2) as to its special tint. Its relative intensity cannot of course in such matters yield information of much value.

Brightness of color would appear to go almost invariably hand in hand with good condition; and, given that the condition of unsound wines is generally bad, it follows that their color must necessarily be dull and dingy. Experience shows that this is generally the case. The special tint, on the other hand, may be made to yield evidence of a more independent character. Unfortunately there does not exist any distinctive tint that can uniformly be ascribed to the diseased state. The different classes of wines made are all respectively more or less distinctly characterised by special normal tints that must be looked upon as peculiar to each, and occasionally what is the normal tint in one class may be indicative of disease in another. Nor, unfortunately, can we by any means look upon color as a stable factor in wines. What we are agreed to describe as the tint characteristic of a given type of wine is after all but the garb of its perfect maturity, reached by gradual and slow changes through the successive and varying periods of youth, and, with the gradual advance of senility and decay, exposed (even in bottle) to still further changes. Nevertheless, data are not wanting that enable us to make some use of the color of wines, at least as corroborative evidence in cases of otherwise doubtful import. More particularly is this the case when, after the so-called doctoring of wines, both palate and nose are at fault, and the color alone testifies, and testifies eloquently, to what depths the wine had been allowed to fall. Broadly speaking, whenever the color of a given wine differs materially from what is recognised as the typical tint of the class to which it belongs there are grounds for suspicion. Of dry red wines the typical tint can be described as "ruby red." Rich shades of purple distinguish their earlier stages, whilst when on the downward march the red becomes more or less markedly tinged with brown, or even yellow. Disease that brings on preternatural decay is usually accompanied by a similar defect in the color. To sweet and fruity red wines this tinge of brown is absolutely normal; it is the badge of their advanced age so essential to the real quality of wines of these classes. Disease, less common here than elsewhere, usually tarnishes the color without appreciably modifying the tint. In white wines that are dry the typical tints vary from pale straw, with occasional greenish variations to the marked yellow-brown so characteristic of the fuller types. Here, contrary to what occurs with red wines, disease is usually accompanied by a darkening, an intensifying of the normal color; shades of black, even, are not of infrequent occurrence. To sweet and fruity white wines these

remarks apply with equal force. It need only be remarked that with the latter the normal color assumes richer and deeper shades. Finally, the complete breaking up of the coloring matter and its deposit in the lower parts of the vessels in which the wine is stored—phenomenon common to certain forms of disease—remains to be noted. In such cases the unsoundness of the wine cannot remain in doubt.

III.—*Nose.*

The nose of a wine is the complex aggregate of impressions that the volatile substances it contains convey to our sense of smell. In sound and well-matured wines, when agreeably developed, it goes by the name of "*bouquet*"; it consists then largely of ethereal substances that pleasantly affect our senses. With it we reach a factor of considerable importance in any examination of the state of health of a wine. In a normal wine the nose may or may not be pronounced and well developed; it may be distinctly ethereal; the amount of spirit present may be such as to drown all other minor odors; it may be purely more or less markedly vinous; it may even be *nil*. The diseased wine is not necessarily characterised by a distinctive nose; in most instances, however, there is no doubt but that such is the case. The chemical decompositions attendant on disease usually result in the formation of by-products of a highly volatile nature; the latter cannot but reveal themselves to the nose in characteristic fashion, often to the exclusion of all other substances. To enter upon a detailed description of the special noses resulting from various forms of disease would be encroaching upon what has been left for future study. It will be sufficient to point out here that, to those accustomed and trained to the handling of wines, the nose of an unsound wine is distinctly abnormal; they cannot mentally associate it with other good wines with which they may have had to deal; it affects their olfactory nerves in a distinctly unpleasant manner. It is usually pungent and sharp, a property that it acquires from the general presence of volatile acids in abnormal proportions; or it may be slightly putrid, recalling organic matter in the course of putrefaction. Whatever its special nature, whatever its peculiarities, an abnormal nose, and particularly an unpleasant abnormal nose, must always convey to the mind of the taster the impression of highly probable unsoundness—impression that can only be invalidated by the higher evidence of both palate and volatile acidity combined.

IV.—*Taste.*

With most practicians in this matter of unsoundness the judgment of the palate is usually looked upon as final; from it they would allow of no appeal. And yet, had they to put it in so many words, they would be sorely puzzled how rightly to convey to the mind of the novice the sum of impressions that experience has taught their sense of taste to associate with the soundness or unsoundness of wines. Perhaps at the present moment I find myself in a similar predicament. We may be perfectly well aware that the cook has spoilt our meal, but how are we to adequately impress the fact on the minds of those who have never partaken of dressed viands? An attempt may, of course, be made to give verbal expression to the sensations by which the palate is affected, but after all there can be no tangible proof of the correct interpretation of the words used. As to the sense of smell, so to the experienced palate, the sound wine, whatever its variations of type, conveys a sensation that is normal, the unsound wine a sensation that is abnormal. Recognition of the abnormal presupposes a knowledge of the normal; the latter, obtainable by experience alone, by the constant and daily association of the palate with wines of all sorts, can only be described in terms that cannot but sound vague and unconvincing in the ears of the uninitiated. The difference betwixt the two is frequently but a question of relativity, and as such can only be described by a

comparison in which one of the terms must be known. Of the unsound wine it may be said that it is generally more acid than the sound one; further, this abnormal acidity affects our sense of taste in a distinctly disagreeable fashion—it conveys with it a sensation of acridity that is foreign to the natural acidity of a wine. In some instances this acridity is associated with a sweetness that in certain types of wine is distinctly abnormal; in others there is the perception of disagreeable after-tastes that only make themselves felt some time after the wine has left the mouth; in others, again, there is the distinctive taste of organic matter undergoing putrefaction. The differences betwixt the normal and the abnormal, the sound and the unsound taste, might in a similar fashion be still further multiplied to a considerable extent, but dealing with the subject from the purely general point of view, as is at present our object, it were, perhaps, better, in view of its evident intricacies, to reserve further details for the special and detailed studies of each separate form of disease.

V.—Volatile Acidity.

The eye, the nose, the palate may one and all sit in judgment on a wine and yet in the end be deceived. What evidence they may bring forward has undoubtedly a value of its own: at times it is irrefutable, nor would it be disputed by those who understand wines; at others, more particularly in the initial stages of disease or after some specious form of doctoring, they may be sadly at fault; or, at all events, in support of their judgment they can bring forward nothing of a sufficiently concrete nature to silence hostile, if ill-considered, criticism. Fortunately we have still in reserve a powerful, if not at present infallible, factor. I refer to the estimation of the volatile acidity of wines. In it, to my mind, we have an exceedingly serviceable and simple method for gauging the health of a wine, and of confirming or invalidating the judgment of our fallible and fickle senses; it is the real pulse of the wine answering sympathetically to the slightest sign of disease. I have already referred to it as not being absolutely infallible in the present state of knowledge. This is not because of any fault that is inherent to it as a method of diagnosis, but because of the natural hesitancy that is apparent in all who have studied the subject to condemn as unsound hundreds of samples of wine in which the palate can detect no very appreciable blemish. Boldness might possibly involve the condemnation of the bulk of our wines. It is not disputed that the germs responsible for the unsoundness of wines invariably generate in the latter various volatile acids. I do not believe that there is any known form of disease that is not characterised by their appearance in some form or other. But it is asserted, and perhaps rightly so too, that the yeast itself, whilst in the course of normal fermentation, leaves in the wine as a waste product small quantities of volatile acids. The mere presence of the latter does not therefore necessarily condemn a wine as diseased and unsound. Nevertheless, although the normal quantities of these acids have been recognised as infinitesimal, there does not appear to be general unanimity as to the limits beyond which any augmentation must constitute positive unsoundness.

Statistical data having reference to this point are by no means as plentiful as could be wished; partly because the great value of an estimation of the volatile acidity of a wine as a method of diagnosis has perhaps not in the past been sufficiently recognised, and partly, I believe, because of the difficulties that have hitherto surrounded the methods recommended for its determination. The direct methods of estimation by ordinary distillation are exceedingly unsatisfactory; for reasons that cannot be entered upon here they rarely give concordant results. Remain those methods that give the volatile acidity by difference—methods that have been proposed within more recent years, and have been practised latterly with a considerable amount of success. They

yield results that are perfectly reliable; they do not involve the use of complicated and delicate laboratory apparatus, nor the exercise of skill that is altogether beyond the reach of the ordinary careful cellarman. The difficulties of the past therefore need no longer deter those cellars with pretensions to enlightenment from taking advantage of an exceedingly useful guide to the condition of their wines. Nevertheless such facts do not remove our original difficulty arising from the paucity of analytical data, and the resulting uncertainty as to what constitutes the proportion of volatile acids normal to sound wines. Our embarrassment is only still further increased by some recent observations that would tend to show that the proportion of these acids is always higher in wines made under hot skies than in those made under temperate ones. For instance, in a note published in the *Bulletin de la Société des Chimistes de Paris* M. Jay states that, according to his observations, whilst in sound and well-made French and Spanish wines volatile acids vary from .38 grams to .40 grams per litre expressed as sulphuric acid (or from .46 grams to .49 grams per litre expressed as acetic acid), in Algerian and Tunisian wines the average reaches the higher level of 1.3 grams to 1.6 grams per litre in sulphuric acid (or 1.59 grams to 1.95 grams per litre in acetic acid), and sometimes higher still. Personally, I cannot bring myself to subscribe to his conclusions, viz., that the above figures represent the real average for normal sound wines of hot countries; it does not appear to me possible that such wines as were examined by him were anything else but more or less unsound. We are well and painfully aware of the greater difficulties that attach themselves to ordinary wine fermentation in hot countries; nor, I believe, would we seek to deny that a greater proportion of unsound wines leave the vats of the latter than those of colder ones. The disadvantages of wine-making in hot countries do not, however, terminate in the fermenting chamber; the higher average temperatures that usually obtain throughout the rest of the cellar considerably increase the ordinary difficulties of keeping wines in a state of good health. To my mind, therefore, it is not to any peculiarity inherent to them that the high rate of volatile acidity apparently present in the wines of hot countries should be attributed, but to the more favorable conditions of development vouchsafed by the climate to disease germs. In judging of their value, however, commercial principles alone can guide us; we cannot, much as we might wish it, take into consideration difficulties that had to be surmounted. Such wines, when a high rate of volatile acidity has been ascertained, under whatever parallel of latitude they may have been made, must continue none the less unsound; for surely it would be the height of absurdity to claim that a wine containing a given quantity of acetic acid would be sound in one country and unsound in another. Nor, as a matter of fact, could we in a matter of the sort, without loss of prestige and consequently of trade, aim at a lower standard of excellency than has come to be recognised elsewhere. And, after all, these difficulties that confront us in our business are not beyond our powers to overcome; in our cellars wines are not wanting to show that they are far from insurmountable—fermentation temperatures can be controlled, great care and attention will enable us to neutralise the advantages that climate offers to disease. In brief, in point of view of genuine soundness and character we can produce wines equal to any of those of the best European makers. Their task is simpler; ours requires more brains.

Although, in view of the paucity of analytical data already referred to, the question cannot perhaps yet be considered as definitely settled, it is more or less tacitly recognised by most European chemists that the normal volatile acidity of sound wines may vary from .5 gram to 1 gram per litre expressed as sulphuric acid, or .61 grams to 1.22 grams per litre expressed as acetic acid. Any notable excess above these figures is usually looked upon as a definite

proof of unsoundness. These figures I think we can safely accept for our own wines; in fact, we cannot do otherwise. Higher volatile acidity will generally be indicative of carelessness or defective methods of treatment that have resulted in some more or less pronounced form of disease. Numerous analyses made in my laboratory show for the samples examined an average of .95 grams of volatile acids per litre expressed as sulphuric acid, or 1.16 grams per litre as acetic acid. As evidencing the influence of the later treatment of wines on the development of these acids, and as proving conclusively that our wines need not necessarily show a high proportion of the latter, it may be stated that of wines taken from the same cellar the average of those six months old was only .5 grams in sulphuric acid, whilst that of the older ones reached 1.19 grams.

Summary.

I have now passed in review the various symptoms characteristic of the diseased state in wines. Such as they are they should all be familiar to all those who have to do with the handling of wines. Briefly summarised they may be enumerated as follows:—The wine usually loses condition, becomes dull, and even cloudy; the coloring matter undergoes partial decomposition, and the tint is no more normal; the nose becomes pungent and disagreeable; the taste acid, sharp, acrid, and generally abnormal; and, finally, the proportion of volatile acids tends to exceed the recognised limits of sound wines.

There is one method of examination, and an excellent one, too, to which I have as yet made no reference. Lest this omission should be attributed to carelessness or ignorance, I must explain what reasons lead me to act advisedly in the matter. I refer to the microscopic examination of the suspected liquid. In the hands of an expert no more certain method of diagnosis could be found. To find a wine that has gone beyond the first racking stage teeming with disease germs is a sure indication of its present or fast-approaching unsoundness. Nor as a matter of fact is the definite identification of these germs—no easy matter be it said in passing—indispensable to the practical value of the information yielded. The certainty that the germs seen are other than yeast germs is quite sufficient for ordinary purposes. The microscope is, however, an expensive instrument, particularly when, as is the case in wine diseases, lenses of high magnifying power have to be secured. Further, its really effective use is inseparable from that special training that must always remain exceptional in wine cellars; in fine, the microscope is the tool of the scientist and not of the winemaker. I recognise its occasional usefulness to the latter, but I deny its absolute necessity. The general appearance of the various disease germs and other phenomena that can only be followed out under the lens of the microscope will in due course be dealt with. Those possessing instruments and qualified to use them may then take advantage of what points may not already be familiar to them. To those not possessed of microscopes, particularly if not rolling in wealth, I would say that the money might be spent in a far more useful manner in other cellar requisites.

(To be continued.)

EFFECTS OF SALT ON SHEEP.—The effect of salt on the health of sheep is not generally understood. Its effect is to give tone to the organism. The ash of the blood of a healthy sheep contains about 60 per cent. salt, and the ash of urine 33 per cent. The scarcity of such an important constituent in the blood means a relaxation of vital energy. The moment this takes place the opportunity for the development of parasitic organisms comes. Salt should be given at least once a week fresh, and be available at all times. Though sheep take very little of it at a time, they show great eagerness for it if they have not had it for a few days.

ORCHARD NOTES FOR DECEMBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The season thus far has proved favorable for the proper development of tree fruits. Strawberries suffered owing to the lack of moisture at a critical time. This critical period occurs when the first crop is nearly all harvested. It is no new thing for the second crop to promise abundantly and then fail owing to drought. This difficulty could be overcome by a little expenditure in conserving water for irrigation, in many localities at any rate. I recently visited a garden in the Lower North where the plants (Ediths) were laden with fine fruits grown under irrigation. I was assured by the grower that upwards of 1,500lbs. had been already picked from a $\frac{1}{4}$ -acre plot, and much more would have been harvested before this appears in print. Fifteen years ago the writer saw similar results obtained under irrigation, and would seriously commend the practice to our more enterprising young growers, where facilities to store or raise water occur. The producers of this colony quickly seize upon new ideas and place them in practice. A few years ago strawberries were brought into market in all sorts of receptacles, and the retailer sold them in a semi-liquid condition over the counter or from the hawker's van. Since that methods have changed, and indications point to all soft fruits being sold in chip punnets. The idea has spread broadcast over the country. In up-country towns the consumer can now get his strawberries in punnets in an almost perfect state of preservation, where a few seasons ago these handy vessels were unknown.

Since writing last month's notes I have visited some of the leading fruit-growing centres, and been much pleased with the improved attention now being paid to the orchards. In the matter of soil cultivation good progress has been made. This is more particularly noticeable in the older plantations. The enforcement of the cultivation clause in the codlin moth regulations, combined with the more hopeful outlook in the export trade, are no doubt responsible to a very large degree for this awakening. Where the tillage has been carried on for several years past the object lesson is complete. During the month just gone most cultivators have been enabled to break down the hard lumps so conspicuous after the first scarifying. Those unable thus far to do so should take advantage of the first moistening showers to put the roller over the ground, to secure the necessary state of pulverisation. Always try to remember that the fineness of the "dust blanket" on the surface is of the utmost importance.

In districts where the season's rainfall has reached 20in. or upwards, irrigation should not be necessary to develop early fruits—such as apricots and cherries—if good methods of tillage have been followed. If the subsoil has not secured a fair store of moisture from winter rains it may be necessary to top-up these fruits by the application of a good soaking. When applying water to fruit trees make the channels of such a depth and in such a manner as to assure the entrance of the water into the subsoil. To attain this end a steady flow is required. As important as this is the after attention to the irrigated soil. The application of water when great evaporation is proceeding tends, under neglect, to ruin the physical character of the soil. It is not sufficient to put the cultivator over the drying surface, and thus pulverise a shallow layer of top soil. Such a proceeding inevitably ends in the formation of "hard pan" in the subsoil, unless it be of an exceptionally free porous nature. "Hard pan" is a ruinous condition, most effectively preventing the penetration of air and moisture, and consequently plant roots. It also prevents the draining away of any injurious chemical substances brought in a dissolved condition by evaporation from lower levels. To overcome the difficulty deeper stirring after irrigating should be adopted in summer, and deeper tillage still

in winter. The grower of a few trees should fork up the *bottom* of his irrigation rings, and the larger grower by mechanical methods attain the same ends.

The apricot and peach crops are patchy, consequently growers near Adelaide may not find much need for resorting to drying or pulping to secure a payable price this season. Every large grower of these rapidly perishable fruits should be insured against sacrifice by having the means on hand—the ripe dropping fruits will not wait—to deal with his crop if necessary. Fruitbuyers are only human beings, and are always alert to profit by the extremities of the grower, consequently the orchardist often suffers through lack of ordinary business forethought, and falls to abusing the manufacturer simply because he displays more judgment.

There is promise of a very large crop of plums, and I am afraid the unsuitableness of the sorts for drying, combined with the above difficulties, will result in depressed prices. Pears have set plentifully, and, with the exception of certain well-defined sorts, will doubtless be low priced. Apples, more particularly the favorite Cleopatra, have a good show of fruit, and, bar accidents, the export should reach record figures next autumn. Green caterpillars have caused anxiety in some parts, but growers can rest assured that unless the tunnels made by these pests reached the core the growing fruits will recover and cast off the present indentations.

Attention should be paid to newly-planted trees, pinching rampant shoots—only the sappy growing point should be removed—from time to time, to the advantage of the weaker and less favorably located branches. Misplaced shoots and ground suckers should be carefully removed.

Waxed cloth upon grafts inserted this season require looking to and removing if the union is complete, or the wax runs down the stock. The simplest way to prevent stricture is to make a cut through the folds on a spot not likely to injure the healing callus. This allows the proper expansion of the union to force away the waxed bands gradually.

If the grower desires to bud any young or old trees the time to insert the buds will depend upon the possibility of the sap being forced to flow in the stock plant by artificial watering. If the natural rise of sap alone has to be utilised the buds could be inserted now and allowed to lie dormant till next spring. This is achieved by allowing the growing top of the *tree above the inserted bud* to remain intact. If water can be applied at any time the insertion of the buds should be left till about February or early in March. In this case they should not be encouraged to start growing until the following spring. Buds which have remained dormant through the winter always make fine growth when spring arrives. A week or ten days after inserting buds bend their adhering leafstalks downward gently. If the leaf stalk parts away from the inserted shield without any direct force being applied the bud has “taken,” and the ties may be loosened a little. A fortnight later slacken them further, and a little later remove them, and the operation is completed until the upper portion of the stock is removed in winter.

Citrus trees troubled with scale insects should be pruned to admit plenty of light and air, and afterwards sprayed very thoroughly with resin compound or kerosine emulsion. Recipes can be obtained in pamphlet form free from the Agricultural Bureau. The larvæ of codlin moth will be actively at work now, and every effort should be made to cope with earlier broods. Always remember each caterpillar destroyed now may avert the appearance of a dozen later on. If the apple and pear trees are small all fruits showing the peculiar sawdust-like burrowings of the insect should be removed as often as practicable. These infested fruits should be boiled or steeped for a day or two in water prior to feeding them to animals. A few sheep turned into old orchards for a day or two at a time will devour all windfalls if no grass is growing in the orchard.

Pigs are also useful in this capacity. The bandages around tree stems must now receive regular attention. They should be examined weekly, and never left more than a fortnight if the escape of moths is to be avoided. In level country, where spraying can be achieved at little cost, this method should be given a fair trial. Paris green, 1oz. in 10galls. of limewater, or arsenite of soda and limewater (equivalent to 1lb. of arsenic in 300galls. of limewater) are recommended. Passing a tree and spraying a quart or two at it as the cart proceeds is useless. Mist the fruit all over—not on the exposed side alone—with a fine spray, and pass on when it begins to run off in drops. The thorough pulverisation or cleaning of the soil beneath and around all infested trees and the removal of rubbish also aid in circumventing this pest.

SUCCESSFUL APPLE-GROWING.

Prof. J. C. Whitten, of the Missouri Experiment Station, has been conducting observations upon the influence of tillage on the growth and vigor of apple trees, and bulletin No. 49, lately published, gives interesting and valuable information. The trees in orchards subjected to different systems of cultivation have been measured to decide upon their comparative growths from season to season, and it has been proved beyond all dispute that the greatest growth has been made in those orchards that have been cultivated the most, and that cultivated trees make a more uniform growth than those that are not cultivated. The uniformity of growth bears a direct relation to the amount of cultivation given. The more the trees are cultivated the less they are affected by the unfavorable influences of drought. Trees which make a fluctuating growth are less likely to endure drought than those which have made a uniform growth. It is a significant fact that the unfavorable effects of drought upon uncultivated trees may not be so apparent during the dry year as it is one or two years later. A great many trees which appeared to stand the drought in Missouri in 1897, and even made fair growth that year, have died in 1898 and 1899 as a result of that drought. Trees which became partially dormant as a result of drought in August, 1898, started into fresh growth as a result of warm wet weather in September and October; trees that were well cultivated throughout the summer suffered less from drought and were injured less by the wet weather in the fall. In cases when cultivation ceases in July and a dry hot August follows, there is the most danger of an abnormal growth in the autumn. The more abundant the growth is early in the season the more necessary it is to keep up cultivation in order to properly mature that growth. If trees are carrying a heavy crop of fruit they may require cultivation in a dry season until the fruit is gathered.

The bulletin emphasises a matter upon which we ourselves have been subject to ridicule on more than one occasion. It says that "It must be borne in mind that it is very undesirable to allow the soil to remain constantly bare of vegetation. The humus is soon burned out of the bare soil, and it soon becomes hard and unproductive. Such soil is less readily penetrated by rain, washes readily, and loses its moisture quickly during dry times." The fact has been practically illustrated again and again in Australia. Where forests once existed there were rich accumulations of humus, the result of ages upon ages of dropping of leaves and twigs from the successive generations of trees. The soil used then to be dark-colored, friable, and very rich. Within a few years after the trees had been destroyed the soil became dense, red-colored, hard, poor, and impenetrable to air and moisture. The humus was silently and imperceptibly, but surely consumed by the heat. Land that is regularly cropped, constantly cultivated, and properly recuperated by the application of appropriate fertilisers will retain its producing powers; whilst land that is left bare and exposed will lose fertility all the time it is so neglected.

NOTES ON VEGETABLE-GROWING FOR DECEMBER.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

On the plains it is of little use at this period to plant any other than those kinds of vegetables which delight in heat. All the members of the melon family are starting to run freely, and where practicable the ground surface should be mulched with loose, but not necessarily decomposed, manure. From Georgia, the great melon producing centre of America, some experiments are recorded respecting the manuring of the melon family. The hills having been prepared in the usual manner with barnyard manure, certain plots were afterwards dressed with chemical fertilisers. It was found that those which were dressed with a sprinkling of superphosphate and sulphate of ammonia, just as the running stems reached a foot in length, showed marked superiority over those untreated. I cannot recall the exact quantities used, but would suggest from 1oz. to 2ozs. of ammonia sulphate and from 2ozs. to 4ozs. of superphosphate should be sprinkled over each square yard of ground and lightly hoed into the soil. Care must be taken not to sprinkle the fertilisers upon the foliage or against the stems. These manures may be mixed together without any loss of manurial value.

The watering of melons is a vexed question. Personally I prefer overhead applications for cucumbers, marrows, trombones, and pumpkins. To obtain the best results from this method the water should be finely distributed and the previously mulched soil thoroughly soaked. Sweet melons, piemelons, and watermelons do not appear so well suited by this method. For these trench-watering is probably best. Overhead sprinkling appears to have a very invigorating effect if applied before sunrise or after sunset. It is not wise to turn on the sprinkler during the heat of a sunny day unless it is allowed to continue until the sun has declined considerably. If this rule is disregarded burnt spots are almost sure to occur in the leaves. All runners should be secured against disturbing winds. The best method is to spread them around evenly, giving each branch proper space, and place clods or stick in short pegs at intervals. By this process the ground is more completely occupied, light reaches every branch, and the blooms are readily accessible to fertilising insects.

To allow tomato plants to spread upon the ground is a common but questionable practice. Moist soil from irrigation channels, reflected moisture-laden heat from the ground, and caterpillars make undesirable inroads upon the fruits grown in this way. To grow large handsome tomatoes manure and water must be applied in abundance. To produce fruits possessing firmness and flavor great care is required in applying these stimulants. The grower who wishes his tomatoes to set fruits early should not enrich the soil by the application of much farmyard manure or force the plants with volumes of water. A moderately rich loam and a limited supply of water until a fair number of fruits are set upon the plants represent the best conditions. After the plants have set to a fruiting habit sprinklings of superphosphate, 2ozs. to a square yard, and liberal waterings will yield good results. In last month's notes a horizontal method of training on wire netting was outlined.

Dwarf beans require abundance of water, and all pods must be scrupulously removed before the seeds develop to an appreciable size within them. Successional sowings should be made at intervals of three or four weeks. The drills should be covered with loose manure or compost to permit the young plants sprouting through unchecked.

Apply water to asparagus beds and encourage strong growth for the remainder of the season. This will strengthen the plants and permit heavier cuttings being made next spring.

In very shady cool positions sowings of salad plants may be attempted. Lettuces should not be transplanted, but merely thinned out. Radishes and cresses pulled or cut very small to ensure succulency and flavor. In small gardens carrots, parsnips, and red beets may be kept in a crisp condition and prevented going to seed by lifting the roots, cutting away most of the outer leaves, and burying the roots in a cool, slightly moist situation.

In the cool mountainous districts summer and winter vegetables will be grown side by side. The comments made in the notes written during the last few months will all have a certain amount of bearing upon the work of the present month, as far as these localities are concerned.

POULTRY NOTES.

By D. F. LAURIE.

The Ladies' Poultry Club (England), founded in 1899, is making rapid progress, and has a long list of members, headed by H.R.H. the Princess of Wales. The object of the club is to encourage among women the breeding and exhibition of high-class poultry. Among other members of the club—well-known ladies in the poultry world—may be named the Countess of Craven, the Hon. F. Amherst, Lady M. Fox Strangways, Lady Reid, and Miss Croad (of Langshan fame). I have always contended that there is a great and profitable opening for women in poultry-breeding. There are hundreds anxious to add a little to their means, and yet it seems as if poultry-keeping on proper lines is never thought of. I do not wonder at this, because for years past poultry-keeping has been looked upon as an unprofitable fad.

It is usual in the newspapers to see reference each month or quarter to the exports of the colony, and although eggs occupy a prominent position and total over £50,000 per year, mention is rarely made of them. Considering how universal poultry-keeping is in this colony, the ignorance of the subject and lack of interest are inexplicable. As far as I am personally concerned, one out of every three people I meet seems enthusiastic on all poultry matters, and these people are numbered by the hundred. Our agricultural and poultry societies might do far more in encouraging people to improve their birds. It must be taken into consideration that many people are slow to believe that the fine birds they see at shows are of any commercial value as utility birds. Again, it must be remembered that too great a distinction is made between high-class specimens as exhibited by fanciers, and what may be termed working birds, such as should be found on all farms. Poultry societies have to contend with men who exhibit chiefly for the prize money, and who, unless benefited by the advertisement, care nothing for the society and still less for the honor of a win. There are many of these people, and they do more harm than good to poultry-breeding.

I have been informed by a considerable number of people that they received very poor treatment from certain vendors of eggs this season, and although in some cases an attempt to atone was made, much valuable time had been lost. I cannot understand how anyone can be so foolish as to tamper with eggs; the general result is a bad name, and no one is, as a rule, bitten twice.

On the other hand, breeders complained that they had received insulting letters from clients who were ignorant of the proper color of chickens of various breeds. For instance, the Langshan chick; every season I see letters, couched in very strong language, reviling the breeder because the chickens were black,

white, and canary, which, of course, is the correct color. Errors in incubation, both natural and artificial, cannot be laid at the door of the vendor of eggs, and yet such is often the case. Many breeders in the colonies send out printed instructions with each sitting of eggs, and the practice should be general. An excellent plan would be, in addition, a concise description of the chickens of each breed at various ages, a few hints on feeding, culling, &c. The object of every breeder of high-class stock should be to establish a name for honest dealing and for high-class birds.

Several readers of the *Journal* are endeavoring to make high-class poultry breeding profitable, and to such I address these hints. Nothing should be left undone that will conduce to success. It is contemptible in people who advertise eggs from their winning birds when they have no intention of selling any but substituted eggs from inferior birds and to keep the best to themselves. It is not easy to suggest a remedy, for although there are doubtless grounds for civil action in the law courts, it would be very difficult to prove the matter. It is one that poultry societies would do well to consider. As regards purchasing birds, my advice is to demand a written guarantee as to purity of blood, and if the bird is reputed to be high class, an additional warranty of conformity to standard and freedom from "faking." I have often seen birds showing the effects of "faking," that is, defects, especially of comb and feather, have been altered with the intention of deceiving. Here there is less difficulty in proving fraud. It is not out of place to refer to the practice of terming pure bred birds "prize poultry"—none but actual winners deserve this name, and it should be remembered that the show, competition, and judge must also be taken into consideration. Amongst reputable breeders in England the general practice is to quote breeders' names; this also is done here, and I know of cases where the cast-off birds of a well known breeder have been advertised as his best birds. Winning birds are not always the most desirable as stock birds; the parents of such a winner are the really valuable ones, and as a rule are not for disposal.

In commercial poultry-keeping the chief thing requisite is to obtain and breed a flock, or flocks, of birds most suitable for the end in view. Therefore, if you require plenty of eggs, make a rule when purchasing high-class stock, to obtain specimens of good laying strains. Many advanced breeders recognise that the requirements of the day must be met, and they are paying great attention to utility points. Naturally, high-class stock costs money, but intending purchasers should get a few good birds rather than a greater number of inferior birds; the latter are dear at a gift. Good layers are difficult to purchase; they are worth more than people would care to give. An ordinary cross-bred hen for killing may be worth from 1s. to 3s., but if she is a really good layer she is worth three times as much to the owner, and yet very few would care to give the true value for her.

A number of people have called on me of late seeking information about poultry farming. In many cases there was little previous experience; most of them had owned prize winners, or had kept poultry for many years, but only one had any idea of handling large numbers. I never advocated poultry farming on a large scale; few experts could make it pay, and even they would be certain to combine other things. Breeding high-class birds for sale at big prices is another matter, and there are not many who make much at that in this colony. By poultry farming I mean the keeping and breeding of birds for the production of eggs and for table-bird breeding. The egg trade is the easier, as there is less outlay, and the returns are always coming in. The facilities for preserving eggs which we now enjoy enable breeders to store eggs when prices are low, so as to sell at a period of scarcity and high prices. It requires an outlay to store three or four months' supply of eggs, but the profit is considerable, and the practice should be followed by the producer and not left to the middle man.

When cool storage becomes more general even the much-abused middle man will give a fair price for eggs and take the necessary risks. Eggs to be stored should always be infertile. Many firms are in the habit of storing eggs in cool chambers at freezing works, and these will always give more money for guaranteed infertile eggs. This is a hint to country friends when selling eggs to pen up their male birds and paste a written guarantee on the package containing the eggs. Good prices are likely to rule for table poultry of good quality for some time to come. I understand the heavy shipments from Sydney and Melbourne have caused much scarcity there. When we breed the correct class of bird, and ship at the proper season, we shall find a prosperous trade with England.

Hints.

Shade is absolutely necessary in hot weather. Heat affects poultry, and many die from its effects. Do not delay in providing shelter of some sort. Give plenty of fresh, clean water, and keep it well shaded from the sun and as cool as possible. Where water is scarce there is no necessity to waste it. Six inch or 8 in. flower pots with a cork in the bottom are excellent; the water is kept cool, and the evaporation is less than from a flat dish or pan.

Green food is necessary to health, and is cooling to the blood in the hot weather. If water is available a patch of lucern, rape, or kale should be provided. When no green food is available give once a week half a packet of Epsom salts mixed in the water for the soft food for a dozen full-grown fowls or ducks.

During hot weather do not use maize, peas, or sunflower seed except in small quantities, and not oftener than once a week; these are all too heating. A little boiled rice is a good food for occasional use now.

Look out for vermin of all sorts and wage unceasing war on them. Vermin-tormented fowls will not thrive, the hens will not lay, and the young birds will not grow. During warm weather dipping in sheep dip may be resorted to. Ticks, lice, and feather mites multiply rapidly and do immense harm at this time of the year.

Keep the young stock growing; feed well on sound food, and give plenty of bone-forming material; for young stock ground cooked bones are the best. Bone cutters cost from 30s. upwards, and repay their cost in no time. The Implement Company, North Terrace, showed me a good one called "The Mann." Buy a small hand mill—do not give too much soft food, but what is used should be freshly ground—one can then vary the diet by grinding various kinds of grain as required.

In hot parts of the colony it is useless hatching at this season; young stock does not grow well during great heat. Separate the sexes as soon as the cockerels begin to show up and get their tails and combs. Much trouble is saved and the birds grow better.

Pullets intended for breeding from should not be forced to lay too early; let them build up a good frame and constitution. If they begin laying feed them well and let them have plenty of cut green bone, as that will provide much egg-forming food and lessen the drain on the immature system.

Keep a watchful eye on each bird; if it is not doing well ascertain the cause, and remedy. Cull the young stock—inferior birds should be consigned to the kitchen. Where breeding for market, birds sufficiently forward should be penned by themselves and got into saleable condition as soon as possible. Prime young birds are worth good money now.

During the next few months many old hens will be past their period of profit and must make room for their juniors. An old bird cooked in the ordinary manner is a tough unpalatable dish, unfit for human consumption. Cooked in the following manner the taste, quality, and flavor will make owners less

disposed to sell old birds for a song. After preparation place the bird in a saucepan containing sufficient water to cover it. When just about to boil remove to the side of fire and allow to simmer gently, but not to boil, an hour for each year up to, say, four hours. If in doubt try with a fork, and as soon as the bird proves quite tender the first part of the process ends. If required for use as boiled fowl it is ready to dish; if as roast fowl, remove from the saucepan and allow it to drain well till cold; then stuff and place and tie strips of fat ham or bacon on the bird and place in a hot oven for, say, half an hour, till well browned. If properly carried out this method proves a great success. It is the only satisfactory method of dealing with ancients, and many people prefer the tender meat of an old bird so cooked to that of proper chicken. You can apply the process to tough goose or turkey, but on no account must the water boil, nor should the bird be cooked to rags.

Keep all yards and houses well swept; disease germs float in the dust on windy days. These yard sweepings are excellent in gardens. New soil should be frequently put in small breeding pens after first removing a few inches of the old soil, which is doubtless saturated with excreta. Scatter well-slaked lime about the yards and roosting houses; do not use quicklime, as the birds may eat it to their detriment.

Any bird looking sick should be isolated and not returned to the general yard until at least a week after convalescence. Different diseases present various symptoms, but it may be taken for granted that a moping bird, or one that refuses food, requires attention. Provide ample space for sleeping accommodation; overcrowding, both in runs and houses, will result in inferior stock, even if actual disease is escaped. Confined areas mean small numbers; too many birds will mean loss and disappointment. Mobs of twenty or thirty give the best results as regards fowls and ducks. Ample range, with abundant grass, seeds, and insect life, alter the case somewhat.

FARM HINTS FOR DECEMBER.

BY THE EDITOR.

The longer straw is left on the field the less value will it have as food for stock. Heat, light, dampness, and other causes make changes in the nature of the straw. Sugar, oils, starches, gums, aromatic properties, &c, are lost, and finally the remnant possesses little more nutritive value than old rope fibre. Deterioration commences when the grain is filled and begins to harden, and it continues until all the valuable properties have disappeared. A ton of straw, when burned, leaves about 50lbs. of ashes to be blown away, and dissipates about 1,190lbs. of carbonaceous and nitrogenous matter, derived from the soil and atmosphere. In Europe a farmer who removes everything from the land and fails to return a full equivalent would be regarded as a lunatic, but in Australia there are many who maintain that the practice of removing everything from the field—in the form of grain for the market and by burning the straw—is actually beneficial to the land. By use of the firestick all the vegetable matter on the surface and some of the organic substances in the soil is destroyed, and thus, by wholesale destruction of plant food, the store of plant food in the soil is said to be increased! How absurd is this!

Long experience has proved that no one can rely upon a natural supply of forage for live stock, more especially in the northern parts of the colony. No wise farmer, therefore, will ever neglect to lay up as large a supply of forage as is possible on every occasion when there is an opportunity to do so. He cannot possibly have too much, even if "seven years of plenty" should follow each

other. There is a certainty of "years of scarcity" and famine to follow. Stacks of straw and hay and pits of ensilage in abundance will justify him in keeping a reasonable number of animals on his pastures, because if these begin to fail, there is the reserve to fall back upon.

There is much promise in connection with the "continuous baling press," a specimen of which may be seen at the Agricultural College, and perhaps all such promises may be fulfilled when Professor Lowrie illustrates how useful the machine can be made in the construction of baled straw barns, sheds, and other contrivances for saving "cocky" chaff, cavings, and straw.

Where the binder or mower has been employed it would tend to an early germination of all seeds of rubbish were the harrows set to break up the caked surface. If 3lbs. of rape seed and 2lbs. of white mustard per acre were sown at the same time there would be a nice lot of early feed should good autumn rains fall, which is sometimes the case. The cost of the seed for a few acres would be insignificant; but the value of early green feed, if secured, would be immense. By loosening the surface soil all the rain that falls will soak in, instead of flowing into the nearest channel; and the fields will be mellow and far more easily worked by the teams at ploughing time than if left in a caked condition.

Where crops of maize, sorghum, millets, and the like are grown, it is essential that the soil shall be kept open to air and moisture by frequent shallow cultivation. Many people do not understand the vital importance of admission of air to the roots of plants—not *exposure* of the roots to open air, but through the interstices of the pulverised soil. Where crops are sown broadcast it is impossible to cultivate with the horse hoe; therefore all annual autumn fodder crops should be sown in drills.

It is a sad case when, after a year's toil, a good crop is just in view and a grass fire comes and sweeps it away. It is more sad when the farmer is compelled to admit to himself that the loss is due to his own neglect to adopt reasonable precautions. Weeds and rubbish on headlands and borders should never be left to endanger standing crops. Firebreaks should be cut at moderate intervals through crops and the spoil used for hay. Stacks, barns, and all buildings should be isolated in regard to grass and other combustible matter; and, finally, the farmers and all servants and others should be prepared with a scheme and all necessary appliances for fighting grass fires should any break out. These remarks apply to all farmers, but with particular force to those who reside within the area of a plentiful rainfall and consequent luxuriant vegetation.

Haystacks should be thatched or roofed with galvanized iron at once. Should heavy rain occur—which is very possible at this time of the year—the damage done to a large unthatched stack, and the cost of taking down, drying, and restacking will cost a deal more than the expense of thatching. Read the paper by Mr. Davis, of Riverton, as read at the late Congress of the Bureau, and published in October issue of this journal.

Whilst horses are working their strength must be kept up by liberal feeding. Corn of some kind is necessary, and this should be given them three or four times a day, together with short food. They are at work most of the day, and at night they need a rest, which they do not get when the whole night is occupied in chewing long hay or even an approach to straw. It does not pay to let horses run down in strength at any time, but especially when they are wanted to do a lot of work.

When we see birds and native animals dying beneath the shade of a wire fence through excessive heat, and yet expose our cattle, horses, sheep, &c., to the full effects of such heat in paddocks with nothing better in the way of shelter than the same wire fence, we deserve the most severe condemnation.

Common humanity demands that shelter shall be provided for all domesticated animals; common sense insists that we shall consider the value of the animals so exposed to risk or loss of health and condition; and common decency requires that we shall be less brutal than the savages who regard not the life of their beasts. It pays in every way to provide some sort of shelter for our live stock.

DISHORNING CALVES.

The practice of dishorning calves is steadily gaining ground from year to year, with the result that the number of polled stores now to be met with in our markets is becoming larger and larger every season. This is as it should be, because experience shows that polled cattle thrive better when fed in yards than others of the same breed and of similar age with their horns left untouched. Another point in favor of di-horning is that when cattle are so treated it is found possible to keep a larger number of them in the same space than if the animals were left in their natural condition. Many farmers still follow the practice of allowing their calves to produce their horns in the natural course, and removing these horns only when the animals are to be put up for feeding or sent for sale to some market where it is known that polled cattle sell better than those with horns. Much better than this plan (which causes considerable pain to the beasts while the horns are being cut off) is that so frequently advocated in these columns during the past ten years—the application of a little caustic potash to the embryo horn roots within a week or ten days of the animal's birth. This plan is simplicity itself. All that is necessary to do this is to purchase at the nearest chemist's a stick of caustic potash and a little common ammonia; a pinch of the ammonia should be put into a little tepid water, and with the water thus ammoniated, the skin immediately over the region of the horn—to the size of about half a crown—should be thoroughly "soaked." Care should be taken not to allow the area so moistened to exceed the size of the horn base. The circular patch thus treated should then be rubbed with the free end of the caustic potash stick (the other end being covered with paper to protect the fingers of the operator), and the process should be continued for a few minutes, or until the skin over the region of the horn begins to redden or become raw. The operation is then complete; the part operated on shortly becomes "crusted" over; this crust peels off in due course, and the "horn root" being thus destroyed there need be no fear of its subsequent growth. In order to ensure the success of the operation the caustic should be used before the calf is a fortnight old.—*Canterbury Association's Journal*.

LIVE STOCK NOTES.

BY C. J. VALENTINE, CHIEF INSPECTOR OF STOCK.

The quarterly reports of the stock inspectors show the flocks to be generally healthy. A few instances of lung, stomach, and intestinal worms have appeared, more particularly in low, swampy country, and general remedies have been used to advantage. Three thousand sheep were dipped for lice. In several parts dipping against ticks and lice has been neglected, and there is in consequence an increase in these parasites. In the southern districts this is especially the case. Those who do dip complain very much of the obstinate neglect to comply with the regulations, and ask that owners should be compelled to dip. A very large number of notices have since been issued; and, unless dipping is proceeded with, informations will be laid to enforce the law. A loss

of ninety valuable sheep from maggots was sustained, and several other losses were noted. Owners should watch their sheep, and dress them if they find the "fly" becoming troublesome. The lambing within the rainfall area has been good, and the clip is in good condition, but not so heavy as last year. Three hundred and twenty thousand sheep have been inspected.

The further inspection of cattle, more particularly dairy cattle, to which more time has been devoted and the services of another inspector used, reveals a number of cases of tuberculosis; so much is this the case that another officer could be well employed and with advantage to the country. Over 100 cattle affected with tuberculosis have been destroyed, a large proportion being milch cows; and in ten cases Koch's bacilli were found in the milk. An information was laid against one owner who would use the milk from a diseased animal after being warned, and a fine inflicted. Great improvements are desirable in the supply of pure water to dairy herds. Cow sheds, yards, and feeding pens are kept in a filthy state, the yards being frequently deep in mire, excrement, and dirt, in which it is impossible to keep animals from becoming dirty, often causing sickness, and in an unfit state to take milk from for consumption. The inspectors point out the necessity of proper cleanliness being necessary for the health and to prevent the spread of disease, but improvement is very slow.

Twenty-seven cattle died and were destroyed through being affected with pleuro-pneumonia, eleven of which were also affected with tuberculosis. The cattle now in quarantine will be released in a short time if no more deaths occur. Sixteen cattle were destroyed for actinomycosis, and four isolated. Six cows were killed affected with cancer.

Thirty-one thousand two hundred and ninety-five cattle were inspected, travelling, in markets, and on farms. Seventy *post-mortem* examinations were made, confirming the diagnosis of the state of the animals. Three thousand two hundred horses were inspected: one horse injured was destroyed, and thousands of "bots" were found. About 1,500 camels were inspected and few patches of mange seen, which yielded to treatment.

Numerous cases of sickness have been reported in cattle, and a number of deaths occurred from impaction, acute indigestion, and other local causes. It is remarked by the inspectors that on farms and places where a few years since stiffness and impaction and other ailments were reported, phosphatic manures have been used, and the animals are in a much healthier condition. The use of common salt, sulphate of iron, and a plentiful allowance of pure bonemeal is of the greatest value in keeping cattle in good health.

ANTHRAX.

The New Zealand Stock Inspector reports four serious outbreaks of anthrax during the past year, the cause being traced to the use of diseased bones for manuring turnips. In each case the outbreak occurred amongst stock grazing on turnip paddocks, all of which had been recently dressed with manures containing crushed bones. It was only where the turnips were eaten down that the disease appeared, probably gaining entrance with the soil. In each case the manures came from the same firm, which is a large importer of bones from Australia. In one instance death resulted to the owner of the infected stock. One man lost thirteen cattle through the outbreak, and over thirty pigs. In each case, following the practice so frequently adopted of feeding the carcasses of dead stock to pigs, the disease was communicated to the pigs through eating the dead meat. This practice is one that cannot be too strongly condemned, and farmers and butchers might learn a wholesome lesson from the experiences in these cases and that related in the previous issue of our journal, where pigs fed on offal, &c., from diseased cattle developed tuberculosis. It is no unusual

thing to see pigs at large about the slaughter-houses suburban to Adelaide, and these pigs pick up any raw meat or offal that may be lying about. No meat should be fed to pigs unless thoroughly boiled. An inspection of various slaughter houses by the New Zealand stock inspectors revealed in a number of cases a disgusting state of affairs with regard to the keeping of pigs in connection with same, and this matter is one that should be carefully inquired into by all local boards of health.

FERTILISERS ACT.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

Cultivators of the soil who use commercial fertilisers will be pleased to know that before the close of the session Parliament passed the Fertilisers Bill. Two years' experience of the working of the 1898 Act, which did much to prevent fraudulent practices, revealed certain defects which hampered the department in taking effective action to prevent fraud under certain circumstances. The new Act has been passed, with the exception of one clause and a few verbal amendments, in the form in which the Bill was drafted. This exception was, however, a very important one, and I can but regret that the powers sought were not granted in this particular instance, which will be referred to later on.

The new Act retains all the clauses of previous legislation which provided for vendors of fertilisers furnishing a guaranteed analysis with every sale, and also the provisions for prosecution of offenders. In addition, every brand of fertiliser must be registered with the Inspector of Fertilisers, and every year before the 31st January dealers have to furnish a statement of the guaranteed analyses of all the fertilisers sold by them. The department has power to publish these guarantees for the information of the public, together with results of analyses of samples obtained by the inspector. This means that side by side with the guarantee the official analyses can be shown. Under the 1898 Act the guarantee could not be published.

The Act also provides for standards for bonedust and superphosphate. No fertiliser containing less than 40 per cent. of bone phosphate may be described as bonedust, and no fertiliser containing less than 15 per cent. of water soluble phosphate and a total of 30 per cent. of water and citrate soluble phosphate may be described as superphosphate or super. These standards will prevent the trickery that was practised by one or two persons in regard to bonedust, and also the sale as "super." of improperly manufactured materials. Readers of this journal need hardly be reminded that during the past two years I have had occasion to refer to the sale as "bonedust" of crushed bones mixed with large quantities of sand, crushed shells, and other matters. This clause will effectually stop such practices.

The 1894 Act provided that persons who *sold* any fertiliser and did certain things were guilty of offences under the Act. The department was consequently at a disadvantage, as an actual sale of an adulterated article had to be proved. The detection by the inspector of bags containing such adulterated material in the possession of the manufacturer or dealer disclosed no offence, although, as was pointed out, it was beyond the bounds of probability that he would have it in his possession except for the purpose of sale. In the Bill as drafted it was made an offence for a dealer to sell, or offer for sale, or have in his possession a registered brand of fertiliser that did not contain the constituents which it was guaranteed to contain. In the Act as passed the words "or has in his possession" have been struck out.

The new Act declares what deficiencies in fertilisers shall render the dealer liable to prosecution. The deficiency allowed in nitrogen is 0.5 per cent., in potash 0.5 per cent., and in phosphate 2.5 per cent.

AGRICULTURAL IMPLEMENTS AT FIELD TRIALS AND SHOWS.

In the September issue of the *Journal*, in our "Notes and Comments," we stated that we understood that there was an association amongst importers and manufacturers by which the shows to be attended were regulated, and that they were liable to a penalty if they broke their agreement with one another. Their supposed action was applauded as avoiding an unnecessary and very heavy expense which, it must always be remembered, the purchaser of the implements has really to pay, but it was suggested that the public field trials were worthy of favorable treatment.

At the latest monthly meeting of the Chamber of Manufactures a letter was received from Messrs. J. & D. Shearer, directing attention to and denying the truth of the statement referred to. The secretary reported that as a result of inquiries of the Chamber amongst some of the largest manufacturers of agricultural machinery he had found that there was not the slightest foundation for the statement that there was a ring of manufacturers, but, on the contrary, the manufacturers interviewed appeared to seize almost every opportunity of exhibiting. The committee was of opinion that the statement was obviously incorrect, and the secretary was instructed to take steps to have it corrected.

We regret that a statement, made in all good faith on what appeared to be most reliable authority, should not have been correct in every particular. On inquiry we find that the local manufacturers are, at present at any rate, not included in this association, but many of the principal importers of agricultural implements, as well as agents for some of the large foreign manufacturers, are, and they have a duly-appointed secretary. Not only does their agreement bind the members not to show (except at certain specified shows), but it also forbids their canvassers and their agents even attending on the grounds where the same are being held.

MILDURA NOTES.

The citrus season just ending has been on the whole a disastrous one for growers. Prices have been unusually low, and the fruit has shown an unprecedented tendency to rot. Fruit picked in May, or thereabouts, was kept throughout the season without much difficulty, but the growers, of whom there were many, who decided to "cure" only after finding what low prices for fresh fruit were ruling during the winter months found the process of "curing" a particularly wasteful one. Nor was there any pronounced rise in price at the end of the season to compensate for the fruit so wasted, lemons, even during Cup week, only bringing 7s. and 8s. a case in Melbourne. The usual price, £7 10s. per ton, equal to 3s. per case, was paid in most cases by agents who bought lemons from growers for candying or shipping, but fruit consigned throughout the season has been fortunately placed if it has netted more than half-a-crown the case on the average. High prices ruled during the latter part of November, but few growers had lemons then on hand. Oranges have sold better.

Fortunately the market for dried fruits has been particularly good, and all stocks were cleared exceptionally early in the season. The phenomenal rise in the prices of currants and sultanas came too late to benefit the growers themselves in most cases, but some have secured extraordinary returns, and the prospects for the coming season for all dried fruits are excellent. The minimum prices provisionally fixed upon by the Dried Fruits Trust, and subject to increase later

should the state of the market warrant it, range from 8½d. to 5¾d. per pound for the different grades of apricots, 7½d. to 4¾d. for peaches, and for raisins from 6¾d. for Muscat sultanas to 4d. per pound for loose Muscats—a slight all-round increase on last year's prices. As high as £8 per ton is being offered for fresh apricots this season—a very marked advance on the usual price of £5 per ton.

The long-deferred assurance of the certainty of railway communication between Mildura and Melbourne, acting upon a previously-evolved feeling of renewed confidence in the stability of the settlement, has had a most marked effect throughout the settlement.

Two new packing companies start operations this season, but the Fruit-growers' Association, which this year paid a dividend of 8 per cent. and a liberal bonus on all fruit "processed" and handled by it, will almost certainly hold its own.

The splendid returns obtained by certain growers from sultanas—running up to nearly £130 per acre in one case, even at normal prices—and the discovery that the sultana vine will thrive in salty and seeped land, to which the apricot, peach, and citrus trees, even the Gordo vines, succumb, has induced great activity in the planting of these vines. In the early winter of this year rooted sultana vines were freely offered at £3 per thousand, and some sold as low even as £2 10s.; but before the end of the winter £8 and more per thousand was paid, and the supply was not adequate to the demand. Immense quantities of cuttings have been put in in anticipation of next year's planting.

The currant vine appears to withstand seepage and salt even better than the sultana, and if returns similar to those of last year could always be relied on no doubt there would be a great extension of the area under Zante vines. Last year was the best on record for currants, some vineyards yielding a ton and a half of dried fruit per acre, which should somewhat surprise South Australian growers; but so far the currant has proved a most erratic bearer, whether through the immaturity of the vines predisposing the young fruit to destruction from the hot winds, or from an inevitable natural susceptibility of the vine to these influences, whatever its age, has not yet been satisfactorily determined by local growers. So far, however, there is no disposition to plant new ground with currants; sultanas are prime favorites.

Mildura has been a happy hunting ground for the Massey-Harris machine agent. Last year there was a great run on the disc harrow, and this season their spring-tooth harrow has been the rage. Both do good work, but in the opinion of many growers the Osborne machines, which have just been placed on the local market, give promise of greater usefulness, so far, at any rate, as these two classes of harrows are concerned.

The double-furrow Massey-Harris plough is used a great deal in orchard and vineyard, and a number of three-furrow ploughs are also in use, though lack of horses prevents their use, except by the largest growers.

This is also a difficulty with the spring-tooth harrows, which cannot be satisfactorily worked with less than three horses for the full width, or two for the half-width machine.

The spring-tooth and the disc, each in its own way—the one in stirring up the soil, and the other in imparting a fine tilth to the surface—do better work than any implements previously in use amongst us; but they do not altogether supersede the old-style cultivators, for there are times when the latter, with their duck feet and weed-cutters, are more useful than the former, also when the vines are spreading, so that there is room for two horses on a wide machine between the rows. The one-horse Planet Junior is still as needful as ever.

Mr. W. H. Potts, Government dairy expert, and a member of the Technical Commission which lately visited Mildura, did a good deal to stimulate local interest in dairying matters by means of an illustrated lecture on that subject.

This is a subject hitherto marvellously neglected in Mildura. The wants of the town as far as milk is concerned are well catered for, but very little attention has been paid to butter-making, and certainly no serious effort has been made to meet the local demand. Of late there are signs of an awakened appreciation of the possibilities before the butter-making industry, and there is certainly "good money" in it. Thanks to irrigation, green stuff may be grown continuously, and locally-made butter has hitherto held its own in price against the best imported factory, being, in fact, very generally preferred to the latter, and never falling much below a shilling the pound.

Pigs and poultry also are two lines promising great profit, and yet sadly neglected so far. Settlers' pork is invariably preferred to butchers' meat, and is seldom sold for less than 6d. per pound, while fresh eggs are always in demand, and very big prices are realised for table birds, young geese, for example, commonly fetching from 7s. 6d. to 10s. each. There are signs in various directions of increased attention being paid to pig-raising, and it is probable that farm and dairy produce will one day be counted among the big assets of Mildura. Certainly there is much land within the irrigable areas which excess of salt renders of little use for fruit-growing, but which, nevertheless, will grow excellent crops of lucern, clover, barley, mangold, and similar foodstuffs for cows and pigs.

WEATHER AND CROP REPORTS.

AMYTON.—Reaping is general, but crops are very light, and the sample shrivelled.

BAKARA.—The weather has been fairly warm. Nice rains fell on the 18th, but since then hot weather has prevailed. Harvesting is general. Feed is drying off fast, but stock are in good condition.

BALAKLAVA.—Haymaking is finished, and the strippers are just beginning. Crops are likely to turn out better than were anticipated a few weeks ago, although the sample may not be as good as last year's. Several loads of new wheat have been delivered. Fruit crops will be light, but the quality promises to be good. There were some heavy thunderstorms about middle of month. One man has reaped and cleaned sixteen bags of Algerian oats per acre from three acres drilled and lightly manured. Another sowed one bag, from which he reaped sixty-two bags. One piece of wheat reaped and cleaned has gone 18 bush., on light limestone land near Pinery. The crops are much better south and east of Balaklava than north and west.

BOOLEROO SOUTH.—Have had some very trying weather. Haymaking is about finished; yield good. With wheat, the early varieties are just being reaped. Locusts have done some damage in the gardens and feed paddocks.

BRINKWORTH.—With most farmers preparations for reaping are almost completed, while some have almost finished. One farmer who has cleaned up has obtained 12 bush. per acre. Some expect 20 bush., while others will only reap 4 bush. per acre.

BURRA.—The hay crop will be lighter this year than last, and unless rain falls during the next fortnight the wheat will be shrivelled. Purple Straw is considered the most suitable wheat for the district, as it is a good variety.

CALTOWIE.—The crops have been much affected by hot winds. Locusts have appeared in small numbers, but no great damage has been done by them. Feed is plentiful, and the hay crop is very heavy.

CARRINGTON.—Reaping has commenced. The crops are mostly light, the dry weather having checked their development. The locusts have done great damage in some paddocks, and have taken more than half of the crops. The wheat sample is a fair one, some paddocks going 64 lbs. per bushel, but the average is 62 lbs. Rabbits are coming in from the back country in search of feed.

CRYSTAL BROOK.—Reaping is in full swing, the crops in most cases turning out better than anticipated. The sample is somewhat pinched though of good weight. A considerable quantity of hay has been cut, and as the wheat has ripened early the hay in many cases has to be left in the stacks until the wheat is gathered. Feed is still plentiful, and stock are in grand condition.

GAWLER RIVER.—The late spell of dry and hot weather has induced premature ripening of many crops, resulting in the grain being pinched. The last rains will benefit the later crops, but have in connection with the stormy weather hindered hay-carting a great deal. The hay

crop is nearly all gathered, and has turned out well. The storms have knocked down much of the standing crops, and some of them will be difficult to gather with the stripper. This will be the cause of great loss of grain. Stripping has commenced. Feed is almost dry now, and is getting short, which tells effectively on the milk yield. The fruit crop promises well.

KOOLUNGA.—Haymaking is finished, with very satisfactory results. Reaping has commenced. Grasshoppers are appearing, but cannot do much damage. A heavy hailstorm occurred on 16th. The hail was very large, some fully 1 in. in diameter. Fortunately it only continued for a short time, and little damage was done. A nice rain followed.

MALLALA.—Hay harvesting is fast coming to a close, with excellent results. The wheat harvest from present appearances will be good, but it is impossible to estimate what the harvest will be. Stock are looking well, and plenty of feed is expected for them during the summer.

MILLICENT.—The weather, with the exception of two or three days, has been very cool and pleasant, with some nice showers, one or two slight frosts, and crops coming on well. Shearing is in full swing; fair clip so far. Grass on the flats is still quite green, though drying off on high ground. All stock are in grand condition.

MINLATON.—A few crops are ready for stripping. There will be some good yields, a few going 20bush. More wheat will be reaped this year than last. There are some good crops of oats. The hay crop is fair. The grain will be very good. No rust has been observed this year.

MOUNT REMARKABLE.—Very changeable weather—a few thunderstorms, but no rain. Locusts are plentiful. Fruit is beginning to ripen. Haymaking is finished, with a yield of about 2 tons. Wheat promises well, 15bush. to 20bush. being the average close to Melrose. Reaping has commenced.

MURRAY BRIDGE.—A welcome rain for the late crops has fallen after about eight weeks of drought. The early crops are ripening fast, but returns will not be good. Stock in good condition, but grass is dry.

ORROROO.—The weather has been dry and mild, which has caused the crops to dry off very fast. Hay harvesting is about finished, with fair results. The reapers are at work everywhere. The average yield of wheat will be light and the sample poor owing to dry weather during October, together with the ravages of the locusts, which have also stripped many gardens of all leaves while the fruit is left untouched to be scorched by the sun.

PINE FOREST.—Very dry weather with several severe frosts, which have reduced the yield a third. Reaping has commenced, but the estimate of yield is far above the actual results. The second and third weeks brought stormy weather and hailstones, but little damage was done, while the rain will increase the yield of late wheats. The hay crop averaged about $\frac{1}{2}$ ton per acre. A stack of hay is now seen on each farm. Stock of all kinds are fat and feed abundant.

PORT PIRIE.—Weather very changeable, with very little rain. Haymaking has been the chief work; the crop was heavy, from 1 ton to 3 tons per acre, and numerous large stacks have sprung up all over the plains. Wheat-reaping is general, but the result is generally disappointing, the grain being very pinched. Some better samples are being reaped from the early-sown fallows.

PYAP.—Changeable weather. Reaping is in full swing.

RED HILL.—Reaping is in full swing. Some of the wheat is pinched owing to hot winds when ripening. Low flat lands have suffered most. In other places the grain is good. Red rust appeared in places, but the hot dry weather has checked its work. On the 16th a thunderstorm passed over, with very large hailstones, damaging some crops, which lost less than half their bulk.

RICHMAN'S CREEK.—Reaping has been general for the last fortnight, but not much has been cleaned yet. While many of the crops are very light and the grain slightly pinched, there are others, especially on fallow, turning out very fair. Some of the drilled and manured crops are going from 16bush. to 18bush., with good samples. Grasshoppers have been very destructive, and most of the gardens have been completely stripped. Most of the crops were too advanced for them, but where they were green they suffered considerably.

RIVERTON.—The weather continues favorable for harvesting. Very little rust, takeall, or bunt has been reported this year. Many crops should yield 16bush. to 18bush. The late sown will yield well owing to nice rains of the middle of this month. Two local chaff merchants have bought large quantities of hay direct from the fields. Orchards and vineyards look splendid owing to the absence of frosts and to good recent rains, which have filled the fruit out well. A splendid crop of fruit and grapes anticipated. Stock are healthy and in splendid condition.

ROBERTSTOWN.—Weather has been very dry. The cool nights are keeping the crops healthy. The hay crop is likely to be good.

SADDLEWORTH.—Hay-carting is general. There is a large area of self-sown, but not as much wheaten hay as usual. Since the storm of the 16th, with half an inch rain, the weather has been cool and pleasant. The wheat looks well, promising a good return. Wool clip is very good, sound, clean, and light in grease. Stock fat.

STANSBURY.—The dry October, together with dry weather in early part of month, has had a serious effect on the crops. The late sown have been benefited by a good rain about the 16th. Some crops are very fair, and reaping will soon commence. The hay crop turned out better this year than for many years past. Gardens look very well. The fruit crop, though not heavy, is considered a very fair one. With favorable weather continuing, this season will prove better than any of late years.

WANDERARAH.—Crops have suffered considerably from hot winds, and the yield will be about a third less than what was anticipated a few months ago. Stock are looking very well.

WILSON.—The season has proved a more disastrous failure than was anticipated earlier in the year. This is chiefly on account of rabbits, which have swarmed in from outside country consequent on the destruction of feed by locusts. Poisoning is done extensively by a few, but it seems to make little or no impression. From one to five bags is the usual result, but some will even go to twenty or more; this is not per acre, but the total reaped. Many will not even take out their machines for reaping.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

December 1, 1900.

A dry and fairly cool month has assisted harvest operations, which are being actively pushed ahead in the earlier districts. Results generally are coming up to expectations; and a yield of 12,000,000bush. this year, as against 10,000,000bush. last, is being estimated by some authorities in the trade. The first samples that came to hand did not augur well for quality, but considerable improvement has since been shown, and it is now certain the wheat this season will be of excellent grade. In a few of the dry districts, where locusts have not eaten all off, very little more than seed will be reaped, but fortunately this does not apply to a very extended area. The low price of wool now, compared with a year ago, causes a dullness in pastoral affairs; but, taken altogether, the outlook and present position of producers is better than it was a year ago.

Business is fair both in city and country, and would quickly show increased vitality if the long-looked-for rise in price of wheat and recovery in value of wool were to occur. In mining matters things are a bit quiet at the new Tarcoola field, although holders of most of the large properties there assert that their further developments continue to prove the permanence of the gold-bearing reefs. The scarcity of water, however, must prevent any extended search for new finds this summer at least. The maintenance of the value of copper continues to keep the mining for this metal in a healthy state.

A very quiet month has been experienced in grain and breadstuffs, but the position does not seem to have become any worse. Freight rates are more obtainable, and at 35s. per ton March-April loading for United Kingdom, with South African option; this seems to indicate we have seen top rates for a time. Melbourne wheat market is very lively, owing, it is said, to charterers not having secured their supplies ahead. They are paying at moment 2s. 9½d., and the result may be to force price up here and in Sydney, where rates are about on a par with ours. Heavy demand for bran and pollard caused these lines to advance, and stocks are reported light. In feeding grains the advent of new oats has led to considerable business being done at lower rates. Hay and chaff are also easier.

In the potato market but little change has occurred. Supplies of new, owing to frosts referred to in previous issues, have been very short, and in consequence fetching high and at times extreme prices. The balance of last season's stocks in our South-Eastern districts and Victoria, however, has allowed consumers to secure old potatoes when new were unobtainable. Onions are cheapening, with quotations somewhat irregular. A sharp downward movement in this line is early looked for.

The comparatively cool weather during the month helped dairy folk to market their produce in good condition, and as the value of butter in Europe well maintained the disposal of this colony's surplus for shipment gave the local market a chance to improve, which resulted in about 1d. rise in prints. Other grades well maintained, so that altogether the average price realised during the spring flush has been very satisfactory. As anticipated, the value of eggs did not much further recede. During the past week a marked advance has been made, and indications point to still higher rates as likely to rule this side of the new year. A heavy demand from Sydney has caused our West Australian buyers to raise their offers, so that South Australian producers are indebted to New South Wales for the present healthy state in this line. Cheese is being sold lower than we think it need be, in the face of the small stocks, for time of year, and the advancing tendency of butter. The anxiety of some cheesemakers, however, to do trade is causing all to accept poorer returns for their produce. There is excellent demand for bacon, but without any improvement in quotations showing. Hams have brisk business in anticipation of holiday requirements. Honey has ruled very quiet, but the supply of beeswax is much short of demand. All almonds coming forward have met with ready sale.

Notwithstanding a steady increase in supplies of poultry forward at the bi-weekly sales improving rates were realised, so that heavy quantities are finding ready sale at high prices, and prospects ahead for consignors are most encouraging, showing that the advice given in the past to country people to look well after the poultry yard is well recompensing those who are doing so in the price of eggs and birds.

MARKET QUOTATIONS OF THE DAY.

Wheat.—New and old, at Port Adelaide, 2s. 8d. per bushel of 60lbs.
 Flour.—City brands, £6 2s. 6d. to £6 7s. 6d.; country, £5 17s. 6d. to £6 per ton of 2,000lbs.
 Bran.—9½d.; pollard, 10 to 10½d. per bushel of 20lbs.
 Oats.—Local Algerian, 1s. 8d. to 2s.; ordinary stout feeding, 2s. 8d. to 2s. 11d. per bushel of 40lbs.
 Barley.—Malting, 3s. 3d. to 3s. 9d.; Cape, 2s. per bushel of 50lbs.
 Chaff.—£2 15s. per ton of 2,240lbs., dumped, f.o.b. Port Adelaide.
 Potatoes.—Old, £3 15s. to £4; new locals, £7 10s. to £10 per 2,240lbs.
 Onions.—New season's £4 10s. per 2,240lbs.
 Butter.—Creamery and factory prints, 9d. to 11d.; bulk, 8½d. to 9½d.; dairy and collectors', 6½d. to 8d. per pound.
 Cheese.—S.A. factory, 6d. to 6½d. for best matured; good new, 5d. to 5½d. per pound.
 Bacon.—Factory-cured sides, to 6d.; nice farm lots, 4½d. to 5d. per pound.
 Hams.—S.A. factory, 8d. to 9d. per pound.
 Eggs.—Loose, 7½d.; in casks, f.o.b., 9d. per dozen.
 Lard.—In bladders, 5½d.; tins, 4½d. per pound.
 Honey.—2½d. for best extracted, in 60lb. tins; beeswax, 1s. 2d. per pound.
 Almonds.—Soft shells, 4½d. to 5½d.; kernels, 1s. per pound.
 Gum.—Best clear wattle, 2d. per pound.
 Live Poultry.—Prime table roosters, 1s. 7d. to 2s. 2d. each; medium cockerels and fair hens, 1s. 2d. to 1s. 6d.; ducks, small birds 1s. 4d. to 1s. 8d.; heavy weights, 1s. 9d. to 2s. 2d.; goslings, 1s. 9d. to 2s. 3d.; geese, 3s. to 3s. 6d.; pigeons, 8½d.; turkeys, 6d. to 7d. for medium sorts; prime table birds, 7½d. to 8½d. per pound, live weight.
 Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

“CHARACTER” IN HORSE'S HEAD.—According to a member of the Royal College of Veterinary Surgeons it is easy to tell a horse's character by the shape of his nose. If there is a gentle curve to the profile, and at the same time the ears are pointed and sensitive, it is safe to describe the animal as gentle, and at the same time high spirited. If, on the other hand, the horse has a dent in the middle of his nose, it is equally as safe to set him down as treacherous and vicious. The Roman-nosed horse is sure to be a good animal for hard work and safe to drive, but he is apt to be slow. A horse with a slight concavity in the profile will be scary and need coaxing. A horse that droops his ears is apt to be lazy as well as vicious.

THICK v. THIN SOWING OF CEREALS.—Experiments conducted throughout several years at the Ohio (U.S.A.) Agricultural Experiment Station and at the Canterbury (New Zealand) Agricultural College appear to disprove the contention of Mechi and several others, and to confirm Professor W. Lowrie's opinion that thin sowing of wheat is not always desirable or profitable. At Canterbury College Blount's Lambrigg wheat, drilled on June 2 and 3, gave the following results :—

Acreage.	Seed per Acre. Bushels.	Yield per Acre. Bushels.
1	1	31
1	1½	35½
1	1½	35½
1	2	39
23	1½	37½

Very similar results were realised with Nonpareil wheat and with Chevalier barley. The gross outcome of the experiments seems to show that 5 pecks gave the most satisfactory results.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, NOVEMBER 19, 1900.

Present—Mr. F. E. H. W. Krichauff (Chairman), Sir Samuel Davenport, Messrs. Samuel Goode, Thos. Hardy, M. Holtze, H. Kelly, W. F. Snow, and A. Molineux (Secretary).

Standard Legal Weight for Bag of Chaff.

The Hon. Minister returned correspondence in reference to requests of the Bureau that a legal standard weight of a "bag" of chaff should be fixed, with the intimation that the information supplied was altogether too slight to show any necessity for legislation.

Considerable discussion ensued.

Mr. KELLY considered legislation altogether unnecessary. The city corporation could deal with the matter in the same way as they check the sale of underweight bread. There was no parliamentary authority for making a loaf of bread 2lbs., but the corporation by-laws fixed it at this, and they could do the same in regard to a bag of chaff.

The SECRETARY differed from Mr. Kelly. The corporation could not interfere in the matter without specific authority, and if they did it would be a farce to have a standard weight in the city while the outside municipalities and district councils took no action.

It was resolved that the city corporation be recommended to take the necessary action to fix the weight of the "bag of chaff" at 40lbs. net.

South Australian Brandy.

Mr. SNOW stated that he had forwarded to a prominent authority in Bordeaux samples of South Australian brandy, with a request for an unbiased opinion. He was pleased to say the report was most flattering. The gentleman to whom he referred had generously offered to supply the Bureau, free of charge, with 1,000 cuttings of Folle Blanche, the proper brandy grape, but owing to our regulation he had been of course compelled to decline the offer.

SIR SAMUEL DAVENPORT and Mr. HARDY said this variety was already grown in the colony.

Golden Crown Grass.

Mr. HARDY stated that while at the Wagga (N.S.W.) Experiment Station he saw the Golden Crown grass (*Paspalum dilatatum*), about which there had been a deal of correspondence lately. He was very favorably impressed with the grass, which was perennial, reputed drought-resisting, and produced a large amount of feed during the summer.

In reply to questions,

Mr. HOLTZE said they had had this grass at the Botanical Gardens for some years.

The SECRETARY said the Bureau introduced seed several times five or six years since, but it would not grow well except in rich moist soils.

Branch Conferences.

The SECRETARY reported that Annual Conferences of Branches had been arranged as follows:—

Northern Branches, at Gladstone, during the second week of February.

Far Northern Branches, at Quorn, during second week of February.

River Murray Branches, at Mannum, during last week in February.

Extracts and Translations.

The CHAIRMAN tabled the following extracts and translations from Foreign Agronomical Papers:—

Turkestan Lucern (*Medicago sativa* var *Turkestanica*).—The United States Agricultural Department, having imported this largely, distributed 1,111 packages in forty-seven states and territories, especially in the semi-arid regions. Four hundred and sixty-six reports were received, 237 being satisfactory and 229 unsatisfactory; in 76 cases the seed had not been sown on account of unfavorable weather. Mr. Robinson, of Los Angeles County, had cut it three times, and it was not affected by a temperature of from 100° to 110°. All seem to agree that it can withstand drought and frost much better than common lucern. The stems are finer, and the leaves smaller and darker green. It appears to be the best fodder plant for dry farms which cannot be irrigated in the West. In the eastern states, with a heavy rainfall and stronger soil, the Turkestan variety is not superior to common Alfalfa.

A German Common School with a Garden.—The U.S. Department of Agriculture published lately observations by Mr. C. B. Smith, an officer of an experimental station, who describes specially a school at Altfer, a village of 2,000 inhabitants on the Rhine. The whole region is intensely farmed, and forms practically one vast garden. Vegetables alternate with orchards, with occasional strips of grain and forage plants. There are 400 pupils and six teachers. In all common schools in the province two hours' instruction is given weekly in fruit-culture, gardening, and general farming. During the last two years of the course of instruction this is compulsory.

Onion-Culture.—Mr. J. W. Killen, of Felton, Delaware, made experiments in 1899. Plots of one-fifth of an acre were planted and cultivated in the same way. No. 1 was unmanured. No. 4 had a complete fertiliser, containing 4 per cent. nitrogen, 8 per cent. phosphoric acid, and 10 per cent. actual potash (muriate) at the rate of 1,000lbs. per acre, and the yield was 353bush. against 105bush. from No. 1. No. 5, fertilised also at the rate of 1,000lbs. per acre, had the same quantities, but sulphate of potash instead of muriate, and the yield was 406bush.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Tanunda, Mr. T. R. Sage; Koolunga, Mr. Geo. Cooper; Booleroo Centre, Mr. James Repper; Port Pirie, Mr. Williams; Baroota Whim, Mr. A. Spencer; Bowhill, Mr. J. G. Whitfield; Mallala, Mr. Jas. Churches; Millicent, Mr. Jno. Davidson.

Reports of Meetings.

The SECRETARY reported receipt since previous meeting of seventy-three reports of Branch meetings.

REPORTS BY BRANCHES.

Angaston and Lyndoch, October 24.

A combined meeting of the Angaston and Lyndoch Branches was held at Lyndoch on October 24, after a visit to the Barossa waterworks, where the members were hospitably entertained by Mr. and Mrs. Rogers at the cottage. The visitors were somewhat disappointed that the scheme does not provide for irrigation on a commercial scale, but were much interested in what Mr. Rogers showed them and told them about the works.

CARE OF THE ORCHARD AND VINEYARD.—At Lyndoch, in the evening, Mr S. O. Smith, of Angaston Branch, read the following paper:—

One of the most important branches of orchard and vineyard work is cultivation. Assume that a person purchases a plantation in the pink of condition and makes up his mind that he can dispense with horse, plough, or cultivator, what are the probabilities of success? In a climate such as we have, and soil that bakes after a shower (and such is the nature of most of the soil in the Barossa district), his trees, if not in the first, certainly in the second season, would show, in all probability, a wretched sample of fruit.

To find the evil results of non-cultivation one need only go as far as his flower or vegetable garden, and unless he has a remarkably friable soil he will find, if he has done a little watering a day or two before, that the ground is baked hard, is full of cracks, and the plants in worse condition than if they had had no water, but instead a little application of the hoe to the soil round them.

Some folks of an economical turn of mind say that much cultivation is not advisable—it lets the moisture out of the ground. But better lose a little than all; for, whether the soil is turned up or not, there is constant evaporation going on through the capillary tubes that form during the process of evaporation. These tubes, if not broken, act as drain-pipes, allowing the moisture to pass up through to the atmosphere; therefore, if the surface soil be constantly stirred, even with light harrows, an immense deal of good results.

Anticipating a dry winter this year, we had orchards and vineyards ploughed early—so as to conserve as much moisture as possible—with the result that as soon as a few warm days arrived the ground, through being soddened all the winter, began to bake. To remedy this, and to enable the second ploughing to be done at leisure, the cultivators were run once through and repeated again after rain, until the ploughing was well under way. Had this course not been adopted a good many acres would now have been as hard as a road.

A well-cultivated orchard or vineyard is generally a well-pruned one, for the man who takes a pride in his garden will not do one thing alone well. He will also plant his trees or vines on suitable soils, and his block of one sort complete—not an odd pear here and an apricot there, showing where failures have been filled in with any tree that has come to hand.

Filling in blanks is not always a simple matter, especially in a vineyard a few years old. A plan adopted first, I think, by Mr. Thomas Hardy is the surest, although somewhat troublesome. A cane is taken from low down on the vine and brought up at a stake about 5ft. high. To this stake a rod or sapling of about 7ft. is hung by a thin wire, which enables it to be moved in any direction during cultivation. In two years the cane, having had all but the last bud rubbed off, will reach down the attached stick and can then be taken down, laid underground, and the end brought up in the vacant space. In two or three years it should form a vine as large as the parent. The connecting rod can be cut off if desired at the third year, or when the offspring is well established.

One important step I must not forget, and that is careful consideration of the varieties of trees and vines before planting. It is well worth anyone's time to visit others who have had a long experience, study their mistakes and successes—as much one as the other. This is one of the easiest methods of borrowing without paying interest, for most men are willing and even eager to warn others against falling into the errors that they first made.

One of the things a beginner should shun is the magnificent catalogue that describes from fifty to one hundred sorts of apples or pears in such glowing colors that he wants almost the whole of them, with the result that in a few years he is busy with the grafting tools.

The vigneron is not troubled so much in this way, as he has very little temptation offered in the way of new varieties in vines. I should strongly advise a beginner in either vine or fruit growing to spend a season at the least with a *competent* pruner (I wish to lay great stress on the adjective though), and at the same time study Professor Bailey's book on the subject of pruning, and especially the Agricultural Bureau's journal.

SHEEP.—Mr. R. Player, Angaston Branch, read the following paper:—

It is rather surprising that there are not more small landowners keeping sheep. A person who holds 500 acres or more should do so. On smaller areas it would pay if it were only to save butchers' bills. They are a source of profit, and there is very little hard work in connection with them.

We find the most profitable sheep are the Merino. They cut more wool than crossbreds, and, being a contented sort, a fairly good fence will keep them in the paddock; but with the crossbred you never know where to find them until you know where the best feed in the district grows.

I would not advise small owners to breed their own, but rather buy from some well-known station. We purchased some breeding ewes from Kanoona, and were well satisfied in finding them far before our own breeding. We go in principally for lamb-breeding for the market, and buy four-tooth ewes—that is two years old—and reckon to get three lambings out of them; then fatten them for market and replace with younger ones. It is more profitable to breed lambs than to keep wethers—at least that is my experience. You see you get two harvests with breeding ewes—the lambs and the wool. If you get your lambs early you not only catch the early market and get the best price, but you are able to get them away from the ewes a considerable time before shearing; therefore you will get more wool. Now a word about the class of lamb to breed.

Some years back we used to hire Lincoln rams from Mr. Angas, and found the lambs to be very good; but latterly the Shropshire have become pretty much in vogue, so we purchased some rams of that breed, and found the lambs better than the Lincoln-Merino cross, being more shapely and not so long in the bone. With the Merino ewe you can get these lambs early, which is a grand point. For instance, if you put your rams with the ewes at the beginning of November, lambing will commence at the beginning of April, and your first picking for market should be ready by the end of July, for that class of lamb at four months old under favorable conditions should go about 35lbs. dressed weight. When purchasing rams do not stick at a pound or two so long as they are good ones; it will pay you best in the long run.

We manage, if possible, to sell all our lambs before shearing; therefore we have no bother in weaning, and the ewes are the sooner ready for the next lambing. I might say, before leaving the lambing subject, that while the ewes are lambing be particular in looking after them. Once or even twice a day you should ride quietly among them to see that everything is going on all right. Leave your dog at home. Many a valuable ewe have I saved by carefully looking after them, and I have also lost a few through carelessness in not looking round every hill and down every gully. Sometimes in these out-of-the-way places the ewes get down with their legs uphill, and being weak through lambing they cannot regain an upright position without help. If that help is withheld through carelessness they die. If at this critical period it is found necessary to assist any of the ewes to lamb (and it is not unlikely, especially if they be young ones, and presuming you have used the Shropshire ram) do it as gently as possible. Do not put her on her feet at once, as she may run off and not come back to her lamb, but leave her quietly to herself, and there is not much doubt about her taking the lamb all right.

The tailing, &c., of the lambs should be done when they are from two weeks to three weeks old. We are always careful to avoid frosts, and though we lose a very small percentage through tailing, &c., we find if any die it is the larger and older ones, thus showing the younger the lamb the less the risk.

Perhaps before closing I might say a word or two about shearing. It would be well before commencing to shear to pick out those that have inferior fleeces. Some may have a ragged appearance, showing different growths of wool: others, again, are almost as fine in the fibre as a spider's web, so that they will show a parting down the back. This indicates a want of density. These I would cull out, shear them by themselves, mark them, and dispose of them, for, having a small flock, it is necessary that all should grow good fleeces in order to increase your revenue. It will not take any more feed to produce a good fleece than a poor one.

Have a press in which to fix your bales, not hanging them by the four corners as I have known some do, for by so doing your bales would be something like the shape of a football. From the press they will come out nice and square. In picking up the fleece stand with your feet at the tail, and take hold of the fore-legs, one in each hand, bring your hands together with an outward sweep towards your feet, holding the tail loosely till you get to the end of the table, when, if you throw the tail part from you, still retaining your hold of the fore-legs, you will have it nicely spread on the table, outside uppermost; fold in the outside edges and roll into the centre. Your table should be of grating, to allow the locks to fall through. Then pull off all dirty or seedy pieces. Those must be packed separately, and on no account put with the fleeces. Pack your fleeces in layers of six, every layer in alternate directions. Your bale should hold between fifty fleeces and sixty fleeces. Do not make it too heavy, or the buyers might think it dirty. Sew the bales neatly, and put your brand and name of farm or town on with stencil plates, and it will look neat and tidy. Not only that, but it will fetch a better price than if done up carelessly.

Now I will conclude with a clipping from the *Register*:—"Mr. X says that the sheep involve him in very little labor. They keep the land clean, provide his family with meat, and give him an income from the sale of lambs and wool, which altogether would provide the revenue for rent at 5s. per acre for all his land were he a leaseholder. This is a valuable record of actual experience, and it amply demonstrates the soundness of the teaching of Professor Lowrie on this question. Mr. X is very appreciative of the development of the export trade in lambs, for, although he does not export, it has doubled the value of the young stock he produces. So satisfied is he of the profitableness of combining sheep-keeping and farming, that he very expressively, if somewhat inelegantly, declares every farmer who, even if he has only forty acres of land, does not keep sheep to be an 'ass.'"

THE HORSE.—Mr. F. K. Warren read a lengthy paper on this subject, largely dealing with the natural history of the animal and records from ancient times till the present date. He urged the breeding of horses which were closely built and strong, not clumsy or gross, and something that will serve in all sorts of capacities from the plough to the buggy. He deprecated breeding from poor mares or sires, and advised those present never to buy half-broken strange horses or fat ones, as the fat frequently covered blemishes. First attention should be paid to the feet of the horse, as without good feet other high qualities were discounted.

MISCELLANEOUS ITEMS.—Mr. George Quinn, the horticultural expert from the Agricultural Department, attended by request, and addressed the gathering on points of interest to the horticulturist noted during a recent visit to Victoria. Methods of raising nursery stock, green manuring, pruning fruit trees, and

other points of interest were dealt with. A discussion followed each paper, and songs and recitations were contributed by Messrs. Sibley, Springbett, and others. The gathering broke up at a late hour after deciding to make the combined excursion and meeting an annual fixture. The country through which the visitors travelled looked exceptionally fine, the crops of feed and corn being in excellent condition.

•

Clare, October 19.

Present—Messrs. W. Kelly (chair), G. Scott, W. Kimber, W. S. Birks, J. Treleven, S. Smith, H. Carter, R. E. Hope, H. J. Yelland (Hon. Sec.), and twenty-eight visitors.

SHEEP AND WOOL.—This meeting was held at the State school for the purpose of hearing Mr. George Jeffrey, School of Mines Wool Instructor, who, speaking from a farmer's standpoint, advised all who had land from 200 acres and upwards to keep a few sheep. For wool-growing he favored the strong-woolled Merino as the best breed to keep, as they were hardy and would thrive where some breeds would starve. The fleece was generally more valuable than other kinds. He liked a wool that would fill the hand, and which had some "character." For mutton, the Shropshire and Dorset Horn were useful sheep. The wool was inferior, but the class of animal was best if early lambs were wanted for market. In that respect they excelled most other breeds. The meat, too, was sweet and of excellent quality. The Merino and Shropshire crossbred had advantages not to be overlooked. The lecturer then exhibited samples of wool, and described at length the process of manufacture. Messrs. Miller and Cummins, representatives of the district, were present, and thanked Mr. Jeffrey for his interesting and instructive lecture. In the evening another lecture was given under the auspices of the Branch in the Clare Town Hall by Mr. Jeffrey.

Clare, September 21.

Present—Messrs. W. Kelly (chair), W. Kimber, R. E. H. Hope, W. S. Birks, J. Treleven, and H. J. Yelland (Hon. Sec.).

CONFERENCE.—Chairman reported shortly upon his attendance as delegate at the recent Congress of Bureaus.

EXHIBIT.—Mr. Treleven tabled Ben Davis and Nickajack apples, both of which command a ready sale.

ENSILAGE.—Mr. H. J. Yelland read a paper to the following effect:—

The theory of ensilage-making is perhaps more easily put into practice than any theoretical ideas of other farm work and products. In a place like Clare, especially as dairying should have a prominent part in agricultural industries, it could be produced with very little cost. It is probably of more value to a dairy than any other farm industry. It cannot be said to be limited to dairy cows alone, but may be extended to other stock. Until Clare can be made to take up dairying as one of her farming industries the matter of submitting to the public useful information on this subject seems to be wasted energy.

Ensilage consists of succulent forage stored before it is dry, with a view of retaining its succulence. It holds its place as a dairy foodstuff simply. Even if the price of beef should rise, feeding on ensilage would not be adopted, but it might be used for stall-fed cattle and sheep during the summer when natural green foods are not obtainable, and then it would be useful in order to keep the alimentary system of the beast in good working order. It would be more useful in this case as a laxative, and would, if used properly, prevent constipation. Its special value lies in the fact that it affords succulent food to the dairy cow and to stock fed on dry foods through the summer months. It will make better butter than most of the fodders, and quite as much, and, if used systematically and carefully, leaves no taint in the milk. It is more difficult to make than hay. You cannot get uniform results by pitching it into a pit or on to a stack anyhow. It must be uniformly stacked. Compared with hay, it is much heavier to cart, requires more labor from time to time, and is more expensive.

In making ensilage our idea is to stop the natural fermentation of the green stuffs that would naturally take place. To be able to avoid this we must understand how fermentation is brought about. Germs of bacteria can be seen, with the powerful microscope, to be clinging to all parts of dirt, straws, green substances, &c.; consequently, when the green foodstuffs are cut, they have millions of these minute organisms clinging to them, and, consequently, these are put into the pit or in the stack. Most varieties of these are killed at a temperature of 125° Fahrenheit. If the temperature of the stuffs is raised to 130° F. the development of the bacteria is arrested, and the green forage does not decay. This temperature is also sufficient to kill the seeds of any plants common to us that may find their way into the pit. If the temperature does not reach that height fermentation continues, for some bacteria, under moderate temperatures, work in presence of air, others in absence of air, and some under either condition, so that ferments carry on their work, and when once the chance of raising the temperature is lost it is never regained again. By aid of the fermentation under fairly low temperature the sugar in the foodstuffs is converted into aldehyde, then alcohol, and finally into acetic acid; and butyric acid, lactic acid, and sour ensilage is the result, and the feeding value is somewhat depreciated. Stack ensilage is often spoken of as sweet ensilage, while pit ensilage is said to be sour.

Stack Ensilage.—It is impossible to chaff the stuffs when stacking it, so it is carted direct from the field to the stack. The site of the stack should be a little higher than the surrounding ground, especially if water is liable to lie about, as it soaks into the silage and introduces germs of putrefaction, which will cause the silage to decay. The green stuffs should be allowed to wilt for a short time, varying from six hours to a day, according to prevailing weather and temperature of air. The general rule is to cut in the morning, cart in the afternoon, and *vice versa*. When laying the foundation of the stack it is best to run the full wagon on to the stack at one end, pitch off, and drive off the other end. This will help to a great extent to consolidate the mass, and there will not be such an extensive "settling" of the stack. However, it will soon get too high to allow the wagons to run over it, then it must be pitched up, the sides and ends of the stack cut straight and trimmed. It is heavy work to pitch green fodder up on to a stack, and it becomes impracticable to make a stack of any great height. It, however, has the advantage of requiring no raising when feeding. Pressure is then applied, either by stones, timber, or old iron, or, perhaps better still, by means of a Johnson press, which is composed of a ratchet on either side of the stack, to which are attached the extremities of a cable or rope, passing over the stack. As the stack subsides these can be tightened. Each ratchet costs about £2. Pressure for stack ensilage should be about 150lbs. per square foot of surface.

Pit Silage.—In the pit a far more reliable sample can be made, and to further improve the sample it should be chaffed. Take a coarse cut and it will run through the chaffcutter very rapidly, and when using it it is much more convenient to pitch out of the pit, and on a close-pronged fork it can be thrown by means of the fork. The greenstuffs are to be brought in after wilting has taken place, and chaffed direct into the pit until it is 6ft. to 8ft. in depth. Leave it in this manner until the temperature has raised itself to 125° or 130° F. by fermentation, then apply another layer, and when that temperature has gone up add more, and so on. In this way it will be found possible to keep three or four pits in the course of filling at the same time, and even then it might be necessary to stop work on one or two occasions to allow the temperature to rise; otherwise we would get sour silage. When the pit is full, as soon as the last layer has reached the desired temperature, put on the weights—about 120lbs. per square foot.

If there is excess of moisture in the foodstuffs, proper fermentation does not occur, not sufficient heat is evolved, and the result will be sour silage. If, on the other hand, the temperature may go too high, if the stuffs are too dry, then they become charred and of a blackish appearance, not being then so palatable and useful to the stock. This excessive heat is due to oxidation, owing to the presence of free oxygen in the spaces between the stuffs, and the drier the forage the greater the spaces. This heat can be checked by adding another layer of forage, and finally the weights. It has been found desirable to check the rise of temperature if it goes above 155° F. Where the pit is used chaffing should not be neglected; still, good ensilage can be made from stuffs that have not been chaffed. A cheap pit may be made if you have a steep hill handy. Cut out a portion of the side of the hill. Make a roadway at the top of the excavation, also one at the bottom, with the substances taken out of the excavations. It would be better if the hill was of a hard formation. Up the open sides fit strong cheek posts and stack old railway sleepers or any strong material on the inside, fitting as you fill the pit. Fill at the top and dispatch at the lower levels. The pits are a cleaner method than stacks, not so much waste is involved, and, as a general rule, better silage is made; but it is much more labor, while the stack has the disadvantage of perhaps not settling quite straight and the weights will shoot over the top. Again the weights have to be raised to the top of the stack, which is an enormous amount of work.

What to Cut and Grow for Ensilage.—Any green edible substances will make silage, but undoubtedly the best substances give the best silage. I have seen it made out of a mixture of dandelions, wild oats, and Scotch thistles, and the stock ate it ravenously. A weedy crop on the farm is often cut for silage, because the heat evolved prevents the germination of the seeds even if they do happen to get on to the land. It is a good plan to put farm-yard manure on a field that is to be cut for silage, because if it is a dirty crop the seeds will not germinate after passing a time in the silage pit. Of crops grown for silage the following may be included:—Oats, barley, wheat, rye, tares, beans, rape, and mustard. When to be used for dairy cattle rape and mustard had better be omitted. By mixing two or three of these you would get a larger bulk of forage. Plant early and fairly thickly. It does not matter so much if you get a dirty crop, because it will be cut early enough for the land to be ploughed and put in with some summer crop.

Mr. Smith said sheaved green fodder makes a compact stack, easier to build than with loose stuff. Sorghum and maize make excellent silage, but would only be pitted when there is more than the stock can consume in its natural green state.

Dowlingville, October 25.

Present—Messrs. J. Phelps (chair), F. Lock, G. Mason, F. Roberts, T. Lomblad, R. A. Montgomery, H. Crowell, T. Illman, J. L. Broadbent (Hon. Sec.), and two visitors.

BLACK RUST.—Considerable discussion took place on this subject. One member attributed the trouble to dry ploughing and sowing seed too deep. One year he ploughed his wheat in; that sown before rain was affected by black rust, while the portion sown after rain was quite free. Self-sown wheat when ploughed under was often affected by the disease. The general opinion of members was opposed to the idea that sowing too deep was the cause, or that one variety was more susceptible than another, as a variety that is free one year is affected another. Most members thought the condition of the seed was the cause of black rust, probably sweating after reaping. All classes of land appeared equally liable to the disease. Mr. Illman tabled wheat with one part of the stool wholly affected with black rust and another part producing a healthy head, showing that black rust did not necessarily destroy the whole plant. [Black rust (*Urocystis occulta*) is a minute parasitic fungus, the spores of which lie on or in the soil after the cereals or other grasses have matured. The parasite will also live on any grass or cereal that can live through summer and autumn. Any spores that are lying about when rain falls would most probably start to grow, but if there are no young grasses or cereals for it to live upon the parasite would die, and any grain sown afterwards would be exempt from attack. Should there be any self-sown stuff about the black rust would soon find a host, and when the "rust" begins to show it is proof that its spores have been reproduced, and other cereals and other grasses in the vicinity may possibly also be attacked.—GEN. SEC.]

EARLY v. LATE WHEAT.—The question of the most profitable varieties of wheat to grow, viz., early or late maturing, was discussed. It was agreed that of late, owing to the dry seasons, the early wheats had proved most profitable, though with a wet season the later varieties would produce the heavier yields.

Minlaton, October 28.

Present—Messrs. J. Martin (chair), Jas. Anderson, S. Vanstone, J. McKenzie, J. D. Mayer, and Joseph Correll (Hon. Sec.).

POULTRY DISEASE.—Mr. Vanstone said several of his fowls had died whilst apparently healthy. They simply collapsed and died. Some laid softshell eggs and appeared to recover. He was recommended to give them some pure crushed bone.

THIN WHEAT CROPS.—Some of the drilled crops have germinated very poorly, and it is supposed by some farmers that the excess of sulphuric acid in the superphosphate has killed the seed that was sown in connection with it.

WEEDS.—Charlock and sheepweed have taken complete possession of some fields in this district, and it is thought that if these fields were scarified or harrowed in summer the seeds would germinate early so that the young plants could be ploughed under.

Mount Remarkable, November 1.

Present—Messrs. T. P. Yates (chair), W. Lange, H. Humphris, J. B. Murrell, J. McIntosh, T. J. Spratt, H. N. Grant, and T. H. Casley (Hon. Sec.).

SAMPLE OF CROP.—Mr. J. McIntosh tabled plants of Purple Straw wheat 6ft. 2in. high, and of Steinwedel 4ft. 6in. high, estimated to be the best crop in the district.

BULL.—Members determined to keep the pedigree dairy bull on the farm of the Hon. Secretary till April, 1901, and each contributes 5s towards cost of maintenance. They were well pleased with the care that has been taken of the bull, and hope that residents will make good use of him.

Auburn, November 1.

Present—Messrs. G. R. Lambert (chair), J. E. Isaacson, E. M. Dudley, and J. T. Kirkbright.

EXPERIMENTS.—Mr. Isaacson tabled Silver King and Ranjit wheats, grown from seed sent out by Central Bureau, sown on May 30 under similar conditions and side by side. Ranjit was 5ft. 6in. high, and members consider it would do well for hay, and possibly also for grain. Silver King was 3ft. 6in. high, a fortnight later than Ranjit in coming out of the flag.

Rhine Villa, November 3.

Present—Messrs. A. Payne (chair), A. Lewis, H. Modistach, H. Groth, H. Mikan, Allan Payne, J. Vigar, G. Schick (Hon. Sec.), and seven visitors.

WILD OATS.—In answer to a question, Mr. H. Groth was informed that the best way to eradicate wild oats from a field is to fallow early [Shallow, so as to avoid burying the seeds too deeply.—GEN. SEC.] and cultivate later on when the plants are up.

OLD AND NEW FARMING.—Mr. J. Vigar read the following:—

I will try to show some of the reasons why the land does not give the returns now that it used to in the early days. With our modern and improved machinery farmers are too much inclined to put in more ground than they can work properly. In the early days the land was worked up better; it was turned up in furrows about 8in. in width and from 4½in. to 5in. in depth, and then well harrowed at least twice, consequently a better seedbed was formed. And it stands to reason that if the ground is worked down to a fine tilth the young roots must be able to penetrate and get a better hold of the soil. Whereas on many farms at the present time the crop is only slumped in. The ground is broken up anyhow, in 10in. or 1½in. furrows, 2in. deep, and turned down like a slab, or, worse still, only half turned over, the seed scattered over it, and the harrows run over it once. Just enough loose earth is scratched up to cover the seed, and the rest left nearly as solid as before it was ploughed, or the tops of the furrows are harrowed down and it is left loose and open underneath, consequently rootfail and starvation sets in. This would not apply so much to fallow as to ground ploughed in the seeding time, because fallow lying open to the weather all the summer would naturally crumble together. Therefore, to ensure a fair return, farmers should fallow and work their land well. With our improved machines we are ahead of the old times in the matter of gathering our

crops, and with the aid of the binder and thrashing machine, which are slowly coming into use, we will be able to put into the market a better sample of wheat; and, what is of more importance, secure a better sample of seed wheat. The strippers in general use destroy a lot of the grain for seed. This will be easily seen if you remember that a bushel to the acre should be about 14 grains to the square foot.

In discussion Mr. Vigar said the gathering of seed wheat by the stripper destroys the grain to such an extent that the result is a great loss to the farmer. He prefers to gather his seed wheat by aid of the stringbinder, and to thrash it out with the disc header. Mr. Groth strips his wheat for seed when the weather is a little damp, as the grain does not so readily crack then.

CLAY SOILS.—Mr. Vigar asked what could be done on claypans, where the wheat fails to stool properly, and was advised to try superphosphate. [Break up about 4in. deep and apply a good lot of new lime at the rate of 30bush. to 60bush. per acre.—**GEN. SEC.**]

SMUT.—Mr. Vigar tabled some barley grass affected with smut, and stated that his fallow is covered with it.

Mount Bryan East, November 3.

Present.—Messrs. E. T. Prior (chair), W. Bryce, T. Wilks, J. Wilks, B. Dunstan, and W. Dare (Hon. Sec.).

WHEAT-GROWING.—Members were unanimous in their opinion that owing to the light rainfall it was not advisable to apply commercial fertilisers to wheat in this district. Mr. Wilks said his neighbor had a much better crop on land that had been under cultivation for years than he had on fallowed new land, the paddocks being only separated by a road. Mr. Dunstan considered it advisable to burn the stubble at least each alternate crop, as it would manure the land. [By destroying a great quantity of organic matter, which would have decayed in the soil and thus produced plant food.—**GEN. SEC.**]

HAYMAKING.—Mr. Wilks advocated raking and cocking hay within half a day of cutting in this district. Some members think hay mowed in the morning should not be raked until the afternoon.

Wilmington, November 5.

Present.—Messrs. J. Hutchens (chair), W. Slee, M. Gray, J. Hannagan, T. Carter, J. Lauterbach, R. Cole, F. Bauer, and R. G. S. Payne (Hon. Sec.).

DAIRY BULL.—The Hon. Secretary reported having consulted the Dairy Instructor in regard to purchase of a Shorthorn bull of a good milking strain for the Branch. A very good bull had been placed under offer, and it was decided to ask Mr. Thomson to make necessary arrangements for purchase of same, and also for obtaining the subsidy offered by the Department of Agriculture to assist the Branch in obtaining an animal.

PLANTING POTATOES.—Mr. Gray reported having tried the method recommended at a number of Branch meetings of planting potato setts with the cut side up, but the result was a failure. He proposed in future to plant with the cut side downwards, as he had been successful in the past with this method.

HAY-CUTTING.—A long discussion ensued on best time to cut a cereal crop for hay, and the consensus of opinion appeared to be that the grain should be allowed to become well formed before the crop is cut.

FERTILISERS.—Some discussion took place on the use of fertilisers for wheat in the Far North, and it was agreed that next season strips of manured crops should be grown alongside the crops without manure.

Mylor, November 3.

Present—Messrs. E. J. Oinn (chair), W. J. Narroway, J. Nicholls, T. J. Mundy, J. Roberts, J. Roebuck, C. Nielson, P. Probert, W. H. Hughes, W. G. Clough (Hon. Sec.), and seven visitors.

PLACE OF MEETING.—Resolved that the meetings of this Branch be held at Mylor during the next six months, instead of at Scott's Creek. There has been much discussion upon this movement, and several members resigned.

Petersburg, November 3.

Present—Messrs. H. Earle (chair), E. Palmer, S. Bottrill, W. Waters, and Jas. Wilson (Hon. Sec.).

CONGRESS.—Mr. Bottrill reported on proceedings of the Annual Congress.

LOCUSTS AND DROUGHT.—Mr. Palmer stated that some time ago he noticed some very promising crops in the vicinity of Nackara, but the locusts had completely devoured them. Other members reported that to the north and east a similar experience had befallen the farmers, many of whom will not reap seed and flour. In the immediate vicinity of Petersburg the crops will return a light yield, provided the locusts leave them alone. Great disappointment is felt at the unpromising state of affairs. The destruction of feed by the locusts adds immensely to the distress, as the income derivable from dairy cattle is cut off, and some provision will have to be made for the preservation of farm live stock.

Woolundunga, October 15.

Present—Messrs. J. Grunike (chair), A. S. Gunning, G. Foulis, T. H. Prosser, J. Walker, J. H. Michael, J. G. Moseley, H. Aldenhoven, and N. Rogers (Hon. Sec.).

CONGRESS.—Messrs. Moseley and Rogers reported on proceedings of the recent Congress, the former dealing also with the advantages of the Annual Congress to all connected with the Bureau.

EXHIBIT.—Mr. Walker tabled a splendid sample of a very prolific pea, the name of which was not known.

LOCUSTS.—The Hon. Secretary reported extensive damage by locusts. Mr. Michael's garden had been cleared of everything green, and in his own orchard nearly 2,000 vines had been stripped to the bare shoots, and all the apricots had been denuded of foliage. Other gardens had been similarly treated. Mr. H. Lowcay, the Inspector of Vineyards, recently visited the district and had given a very instructive address on Phylloxera.

Gradock, November 3.

Present—Messrs. R. Ruddock (chair), J. Paterson, W. Symons, J. H. Iredell, B. Garnet, W. Haggerty, J. H. Lindo (Hon. Sec.), and two visitors.

RABBITS.—Mr. Symons stated that rabbits swarming in from the outside country had eaten off hundreds of acres of wheat in the hundred of Yednalue. During his absence from home for four days they had completely stripped a patch about fifty chains by fifteen chains. It would be useless to put in another crop until the pastoral blocks on the east were fenced off with rabbit-proof netting, as the country was so poor that any attempt to enforce the provisions

of the Vermin Destruction Acts would simply result in the abandonment of the country by the lessees. Under these circumstances he thought it would be to the interest of the Government to assist in erecting a fence to keep the rabbits out of the settled districts. All members agreed that something should be done at once to protect the crops of future years, and the Chairman was instructed to convene a public meeting to deal with the matter.

CONGRESS.—Delegates reported on proceedings of Annual Congress. They thought some alteration in the mode of addressing the meetings was advisable, in order to give the most practical men a chance to express their opinions.

Mannum, November 2.

Present—Messrs. J. G. Preiss (chair), R. Heidrich, R. P. Scott, E. Schuetze, J. W. Haly, G. Lenger, J. H. Wilhelm, A. Faehrmann, J. A. Schulze, B. Baseby, J. W. Walker, and Hy. Brown (Hon. Sec.).

TAKEALL—A letter from Professor Lowrie dealing with cause of this trouble was read, and considerable discussion ensued. Members, while admitting that cultural operations may at times affect this disease, thought it could not be entirely attributed to lack of or wrongly applied methods of cultivation. Members were unanimous in expressing the wish that the Professor would visit the district and advise farmers as to the effectual treatment of land to prevent takeall. [Send an invitation to the Professor, who is always willing to satisfy a desirable thirst for knowledge.—GEN. SEC.]

ANNUAL REPORT.—The Hon. Secretary's annual report showed that eleven meetings had been held during the year, with an average attendance of seven members and three visitors. Papers on "Seeding," "Poultry," and "Dairying" had been read, and, with a number of other practical subjects, well discussed. A conference of the River Branches, held at Mannum, had proved very successful. A pure bred Jersey bull had been obtained on loan from the department, and his services were appreciated by the local cowkeepers. The Chairman reported on proceedings of the Annual Congress, and urged country members not to neglect the opportunities afforded by these meetings of gaining useful information. Mr. J. G. Preiss was elected Chairman, Mr. E. Schuetze Vice-chairman, and Mr. Hy. Brown re-elected Hon. Secretary.

BRANCH CONFERENCE.—It was decided to hold the Annual Conference of River Murray Branches at Mannum during the last week of February, 1901.

Baroota Whim, November 7.

Present—Messrs. F. H. Flugge (chair), T. Simper, C. F. Bessen, James McDougall, W. Brideson, and C. W. Hoskin (Hon. Sec.).

CONGRESS.—Degelates reported on proceedings of Congress. They considered these meetings and the visit to the Roseworthy College exceedingly instructive, especially those interested in the use of manures.

RABBITS.—Mr. Simper wished to know best means of exterminating rabbits. [Sandalwood twigs, poisoned with strychnine and sugar.—GEN. SEC.]

WHEAT EXPERIMENTS.—Mr. Flugge reported that Ranjit wheat from Central Bureau made good straw, was 3ft. high, but the grain was much pinched owing to the hot north winds. Mr. Bessen stated that Dart's Imperial, received two years ago, had produced very good grain this year, notwithstanding the fact that the hot winds during October seriously checked its growth. Mr. Simper reported very favorably of Marshall's Hybrid.

Brinkworth, November 8.

Present—Messrs. R. Cooper (chair), G. Freebairn, C. Ottens, S. Aunger, J. F. Everett, J. Graham, J. Stott (Hon. Sec.), and four visitors.

SEASON.—Mr. Freebairn reported that the rainfall for October at Condowie was only 0·28in., the lowest in his experience for twenty years; still the wheat crops on his farm were exceptionally good.

WHEAT EXPERIMENTS.—Mr. Freebairn reported that he sowed the Majestic wheat on two narrow strips of land with a cart track between. Although every condition was, as far as he could see, quite identical, one strip was good, the other bad, a fact which he could not account for. Mr. Ottens reported being very well pleased with the growth of Ranjit wheat from the Central Bureau seed.

Bowhill, November 3.

Present—Messrs. E. Weyland (chair), G. Knight, A. Dohnt, G. A. Prosser, N. P. Norman, J. Gregory, and F. A. Groth (Hon. Sec.), and two visitors.

POULTRY NUISANCE.—Mr. G. A. Prosser stated that he had lost a number of chickens from the attacks of some animal. The chicks were found dead with a severe bite across the back. Some young cats were also destroyed, the animal making a hole in the back of the head and apparently sucking the blood. [A small marsupial, about the size of a large rat, is the aggressor. It lives in a hollow tree not far away.—GEN. SEC.]

Mount Compass, November 10.

Present—Messrs. M. Jacobs (chair), S. Arthur, R. Cameron, F. Slater, W. Gowling, F. McKinlay, S. Herring, C. S. Hancock, and A. J. Hancock (Hon. Sec.).

SEASONABLE OPERATIONS.—Plant potatoes, sow melons, pumpkins, marrows. transplant cabbages and tomatoes.

RAINFALL.—For October, 2·22in.; for year, to date, 38·13in.

CABBAGE SEED.—Members think it desirable to sow two or three rows of turnips amongst cabbages intended for seed, in order to secure fertilisation of the cabbage blossoms. [This would ruin the crop of cabbages raised from the crossed seed, should fertilisation occur between the turnips and cabbages. It is imperative that all varieties of Brassicaceæ shall be grown so far apart that the pollen of one variety shall *not* be conveyed by insects to the blossom of another variety. Cabbages, cauliflowers, turnips, rape, radishes, mustards, kohlrabi, etc., all belong to the order, and must be kept separate if grown for seed.—GEN. SEC.]

CATERPILLARS.—Mr. Jacobs produced some caterpillars which were attacking the fruit on his young apple trees. Sent on to General Secretary. [Caterpillars escaped, but the young fruit apparently gnawed by caterpillars of *Cacaesia* moth.—GEN. SEC.]

Wilson, November 3.

Present—Messrs. W. H. Neal (chair), R. Rowc, H. Ward, J. H. Gill, T. Barnes, T. Matthews, A. Crossman, J. Coombes, and A. Canning (Hon. Sec.).

LOCUST POISONING.—The Hon. Secretary reported having received from Central Bureau a quantity of arsenic for preparing poisoned baits for locusts. He found the baits very attractive to the locusts; they ate them greedily, and soon succumbed. The main body had, however, reached the flying stage, and

were consequently very difficult to deal with. Members were of opinion that with seasons like the present it would not pay to poison the locusts. [Has any member any evidence of this? The Hon. Secretary's experiment proved that the locusts can be easily poisoned, and surely, in view of the cheapness of the materials, and the fact that the locusts can be poisoned before they get beyond the hopper stage, it is worth trying the remedy.—GEN. SEC.].

SEASON.—Members reported that the crops generally were failures; many will return less than seed, and hundreds of acres will not be reaped at all. Wheats sent out for trial had failed on account of the drought, and the ravages of locusts and rabbits,

PROVISION OF FODDER FOR SEASONS OF DROUGHT.—Mr. Warren's paper, read at the Congress, was discussed. Members were agreed that, although much more might be done occasionally in preserving fodder, it was usually difficult to grow or obtain much for treatment. The past five seasons have in this district have been almost total failures, making it nearly impossible to conserve fodder of any description.

Hartley, November 7.

Present—Messrs. J. Sanders (chair), H. Reimers, A. Thiele, J. Jaensch, T. Jaensch, W. Klenke, W. Kutzer, and B. Wundersitz (Hon. Sec.).

RABBITS.—Mr. J. Jaensch considered the best way of destroying rabbits was by use of phosphorised pollard in summer, and by trapping and using ferrets in winter. Mr. Thiele would dig up the burrows in winter and keep them destroyed. Mr. Sanders said the burrows should be left open, as if filled in again the rabbits would burrow in the soft dirt.

RATS.—Mr. Sanders found it a good plan to sprinkle strychnine on a tin of milk to get rid of the rats. Mr. J. Jaensch caught a number of rats by placing traps in a pig trough and just covering them with milk. One member reports having had six young pigs killed by rats.

Angaston, November 10.

Present—Messrs. F. Salter (chair), J. Heggie, A. Friend, J. E. Snell, J. E. Swann, P. Radford, W. Sibley, R. Player, S. O. Smith, and E. S. Matthews (Hon. Sec.).

EXHIBITS.—Mr. R. Player tabled splendid samples of Purple Straw and Ranjit wheats. The Ranjit was 6ft. high, with very large heads.

VALUE OF FERTILISERS.—Mr. J. Heggie said he had reaped 26bush. per acre of King's Early wheat in the North through drilling in the seed with fertilisers, whilst his neighbors reaped only 7bush. per acre from seed sown broadcast without any fertiliser.

WHEAT SUITABLE FOR THE DISTRICT.—Members favor White Tuscan and King's Early for this district.

FERTILISERS.—Mr. R. Player read a paper entitled "My Experiences in the Use of Fertilisers." The following is the substance:—

In the earlier days the virgin soil yielded good crops with very little trouble or expense, but continued cropping with cereals without application of manures has exhausted the capacity of the land to produce heavy crops. Still, there are very many who continue to plough and sow without fertilisers, and reap crops of only 5bush. or 6bush. per acre, but they attribute the poor yields entirely to "bad seasons." Some try to make up the deficiency by cropping larger areas, but the fact is that 100 acres put in carefully will yield more than 200 put in anyhow. We have forty-five acres which have been cropped almost incessantly for forty years, and at last yielded scarcely anything except wild oats. We concluded to fallow this during July 7in. to 8in. deep, instead of 3in. or 4in., as usual. We found "hard pan" at 4in., and it

required new shares to break it up. Next the land was scarified, and again it was scarified at seed time, when the seedbed was mellow, level, and worked down like an onion bed. The seed wheat was drilled in with bonedust, and at harvest time there was scarcely a wild oat to be seen, but a splendid crop of 19bush. of wheat was the result. Wild oats make very poor hay, but it is found that the best wheaten hay gives strength and vigor to the horses, and the land is not befouled with seeds of oats and other rubbish resulting from the dung of the animals. White Tuscan makes the best hay, as it seems to contain more nutriment than many other varieties of wheat. The use of fertilisers—especially phosphates—improves the nutritive value of the natural grasses and herbage of all sorts, as well as of the stubbles. Most probably the deep ploughing and thorough scarifying in winter had a deal to do with the yield of 19bush. per acre just referred to, and the bonedust did the rest. An adjacent paddock of twenty acres, not fallowed but ploughed the usual depth, was drilled with Thomas phosphate. The harvest gave only 6bush. per acre. This seems to prove that the deep winter cultivation had a good deal to do with the 19bush. return. It is desirable that the "hard pan," or subsoil, should be broken up and pulverised, as this gives something like new land to sow the seed upon.

Mount Pleasant, November 9.

Present—Messrs. G. Phillis (chair), W. M. Vigar, W. Lyddon, F. Thomson, H. Drogemuller, J. Maxwell, and J. A. Naismith.

AGRICULTURAL COLLEGE.—The Chairman reported having visited the Roseworthy Agricultural College on October 24, in company with Messrs. Lyddon, Vigar, and Giles. Professor Lowrie courteously showed them round the farm and explained matters in connection with the experimental plots, methods of cultivation, &c. They obtained a lot of valuable information concerning the use of fertilisers. A hearty vote of thanks was accorded to Professor Lowrie for his attention.

SEED EXPERIMENTS.—Mr. Lyddon tabled samples of lettuces grown from Bureau seed. Members considered these to be of high quality. He also tabled Quality pea, a good bearer, and fine sample of broad bean; he had been growing this latter variety for over twenty years.

Nantawarra, November 10.

Present—Messrs. Jas. Nicholls (chair), H. J. Spencer, S. Sleep, E. J. Pridham, R. Uppill, E. J. Herbert, A. F. Herbert, R. Nicholls, J. W. Dall, A. S. Greenshields, G. Belling, T. Dixon, jun. (Hon. Sec.), and three visitors.

"ECONOMY ON THE FARM."—Members discussed Mr. J. W. Dall's paper, as read at the late Bureau Congress. Mr. Pridham did not think it advisable to employ more labor than was absolutely necessary on the farm [Neither did Mr. Dall in his paper.—GEN. SEC.], but agreed re thatching stacks. He failed to see how an acre of fallow was worth 14s. until actual returns were secured; and gave actual cost of his own fallow and return from same, which left him only 4d. per acre. Mr. Sleep advocated use of sheet iron for covering stacks, because water could be saved from the roofing, and this would be a valuable asset. Mr. R. Nicholls did not think farmers turned their horses out unless compelled on account of feed. New implements should not be purchased on credit—that was a bad plan. The chairman was pleased with the reception given the paper at Congress, and thought it beneficial to the Branch. The practices of successful farmers were usually quickly followed by neighbors; but it was often found that, owing to variation of seasons, the practice of one season was nullified by the experience of another season. Mr. Dall was gratified to find members so industrious in searching for objections to his paper and finding so little. He did not advocate employment of labor unnecessarily on the farm, but only such as could be used profitably. He considered 4s. per acre a fair estimate of the value of ploughed land.

CAPE BARLEY.—Members think the best way to thrash Cape barley is either to tread it out with horses or roll it out with a conical roller, with small end attached to a stump with a swivel.

EXHIBITS.—Mr. Pridham tabled sample of Majestic wheat from Central Bureau, also Rattling Jack and Fillbag, all sown on the same day for comparison. The Majestic was badly blighted. Mr. Herbert's Majestic also suffered in the same way. Mr. Uppill tabled Ranjit wheat 4ft. high, and earlier than Purple Straw sown same day in the middle of May. Mr. Dall invited members to inspect growing crops of Baroota Wonder and Smart's Pioneer Purple Straw, which seem to do well in this district. Opinions were divided as to which oat does best, some favor White Champion and others prefer Algerian.

Tatiara, November 3.

Present—Messrs. Thos. Stanton (chair.), T. Hall, J. Rankine, E. Prescott, D. Makin, H. Killmier, R. Penny, F. Smith, R. Scown, A. D. Handyside, M.P., and W. E. Fisher (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary reported that eleven meetings had been held, with an average attendance of only five members. As one member had only missed two meetings, and two others three, it was evident that the majority of the members were not doing their duty to the Branch. Unless they made up their minds to attend more regularly, the Branch had better be closed. Only one paper had been read, and there had been but little useful discussion at their meetings. Mr. W. E. Fisher was elected Chairman and Mr. Thos. Stanton elected Hon. Secretary for ensuing year.

Johnsburg, November 3.

Present—Messrs. G. H. Dunn (chair), F. W. Hombsch, L. Read, J. Read, W. McRitchie, T. Thomas, T. Potter, L. Chalmers, H. Napper, and one visitor.

THE FUTURE OUTLOOK IN THE UPPER NORTH.—Paper by the Hon. Secretary (Mr. T. Johnson) on this subject was read as follows:—

Reviewing the past five years in the Upper North, and the disastrous results accruing from the total failure of the crops, anyone regarding the matter in a serious light must come to the conclusion that some other and totally different means must be adopted to enable some of those settled here to obtain a living and make both ends meet. The question of large holdings is bound to be recognised as a way out of the difficulty, but how this is to be regulated is a matter of no small importance. That it must be done sooner or later is apparent. It seems most unfortunate that some of the good land within the rainfall and lately in the market could not be secured and a portion of the farmers in the dry areas settled on it. If this were done, say a person wishing to sell to his neighbor might do so, and a certain percentage of the value of his improvements credited to him to enable him to make a fresh start elsewhere, and the balance of same taken over by the buyer and allowed him on easy terms of payment. If a person held, say 3,000 or 4,000 acres— a portion bush country—in the dry districts he would do fairly well providing he did not overstock, and with a few sheep, dairying, breeding horses of the right stamp, either good draughts or Indian remounts, and poultry-breeding, a fair to good living might be reasonably expected. An article on the qualification of Indian remounts appears in the September number of the *Journal of Agriculture*, and was read and discussed at our last meeting. Members would do well to read and study this, and would, no doubt, come to the conclusion that, if conducted on proper lines, it would pay better than growing wheat, providing one could hold sufficient land to enable him to carry out the undertaking successfully. The majority of the land in the Upper North is only adapted for grazing, owing to the rainfall being so variable. Some appear to think that the egg and butter industry may be overdone, and prices reduced to a low ebb accordingly if carried out on a large scale throughout South Australia; but, providing we can produce enough to export largely, there is every prospect of a better market than that obtained locally, and better values accordingly. In a short paper I do not claim to be able to solve the problem of the position of many of our

farmers settled in the dry districts unsuited for agriculture, but I do think the subject is well worthy of discussion by Branches of the Agricultural Bureau, and something may be done by which a large portion of the Upper North may be conveyed into large holdings, and thus carry a population adequate to its suitability.

A splendid discussion ensued. Members favored the breeding of draught horses of a good useful stamp (which would command top price), the keeping of dairy cows and the use of the separator, and attention to poultry for eggs and for export.

SANDGUARD FOR PLOUGH AXLE.—Mr. Napper tabled ingenious sand-guard for plough or scarifier axle made out of the bottom of a jam tin.

Gumeracha, November 13.

Present—Messrs. D. Hanna (chair), S. Gent, J. Monfries, W. A. Lee, W. Jamieson, W. V. Bond, J. C. Gall, and T. W. Martin (Hon. Sec.).

EXHIBITS.—Chairman tabled samples of wheats grown from seed supplied by Central Bureau, as follows:—Ranjit, 5ft. 6in. high, in full ear; Majestic, 3ft. 3in., just bursting; Silver King, 4ft., just coming out.

"BREEDING AND MANAGEMENT OF SHEEP IN LINCOLNSHIRE."—Mr. T. W. Martin read the following paper:—

The farmer commencing sheep-breeding is careful to make a selection of good young ewes, about a third two-tooth and two-thirds four-tooth, or, as they are there termed, shearling and two-shear sheep. He purchases more than he wants, then carefully selects those with broad loins, straight backs, wide briskets, and muscular necks, with wool thickly set and broad staple, and disposes of the culls.

He buys, or frequently hires, the best rams his judgment and pocket allow, often giving as much as seventy guineas for the use of a ram for a single season—six weeks. The sheep are the Lincoln sheep, producing very heavy fleeces and much mutton. They suit the county better than any other sheep, and yield better returns.

He is careful that the ewes shall be in an improving condition when he puts the ram with them. Should they be in high condition he puts them in a poor pasture a month before, then, ten days before he puts the ram with them, on good pasture, when they begin to improve. He puts shearling rams, and sometimes lamb rams with four-tooth ewes, because he finds by so doing he gets a very high percentage of lambs. Many of the ewes will have pairs, and, being strong, they can support them.

The rams are daubed on the brisket with red ochre mixed with oil. By this means the farmer finds out which and how many ewes have been served, as the ram leaves behind a red stain on the ewe's rump. It also enables him to tell to some extent whether or not the rams are answering the purpose. After three weeks the ram is again marked, but this time with lampblack mixed with oil, and during the next three weeks those ewes which are not in lamb have a black mark. He takes the ram away after six weeks, and should there be any ewes that are not marked they are fattened and sold.

If there is any appearance of tick in the flock the ewes are dipped and the tick destroyed as soon as they come from the ram. Should scab appear mercurius ointment is used, about 4oz. on each sheep, which is always effectual, and it improves the growth of the wool to an extent which covers the cost of the ointment and the labor.

Ewes winter on pasture land, and during snowstorms they are supplied with turnips or mangolds until the grass reappears.

When the lambing season approaches the ewes are carefully separated. Those with the red mark only are placed in a field near the farmstead, where they may be readily fed and placed in comfortable folds at night.

During this season a man is in attendance night and day to see that the new-born lambs do not perish from cold (for there snow often falls in March), and that no harm comes to the dam. In about three days the young lambs and their dams are placed in sheltered fields, and if the weather is inclement the ewes are fed on mangolds, linseed cake, and oats to keep up the supply of milk. If the lambs have plenty of milk they do not seem to mind even snow after they are three days old.

After three weeks the second part of the flock is brought into the "lambing field," but as this is a much smaller lot generally, and the weather is improving, there is not so much attention required.

The shepherd and his assistants now begin to "tail" and castrate the lambs. Most farmers attend to this business personally. They prefer to use the teeth when possible, but

forceps may be used with safety if, after each day's operation, they are washed in hot water, in which a few drops of carbolic acid have been placed. The operation is always performed in the forenoon, and a dry warm day is selected. The operator has the lamb's back to the wind. After about two hours the lambs are raised to their feet to encourage any clots of blood to fall. These things are done because agers of experience teach that there is little danger of losing lambs when they are thus treated. Lambs intended for the butcher are generally the lambs of old ewes which have single lambs, and they are not castrated. They go to market in about ten weeks after they are dropped; the dams are then fattened and sold.

The wool is scoured on the sheep's backs. There is no difficulty in this in Lincolnshire, water being plentiful generally. A tank is built near a running stream, about 12ft. x 12ft. and 6ft. or 8ft. deep, with a race for the sheep to walk out after having been scoured. The water is led to the tank by means of a V trough or a pipe, and flows constantly through the tank. Four or five sheep are thrown into the tank, and as they swim about men on the sides of the tank stir the wool about by means of poles, on the end of which a cross-piece is fixed like a rake-head. A barrel with the head out is secured in a corner of the tank, the top of which is about 6in. above the surface of the water. In this barrel a man stands, and takes the sheep one by one, turns them over and washes their bellies. Then the sheep swim away to the race and pass out. Four men can scour about 250 sheep a day.

The sheep are shorn about ten days after washing, if the weather has been warm enough to dry the wool and cause the grease to rise through the wool sufficient to cause the shears to run freely and to give a glossy appearance to the wool. As the lambing season is March and the shearing time June, lambs are sixteen months old before they are shorn, and the wool is 12in. to 16in. long.

The lambs are weaned about the end of August, and are placed on good pasture, if possible. Should the pasture not be good enough, the lambs are fed with Enfield cabbage which has been cut up a day or two and allowed to wither. This has been found to be the very best green feed possible for weaned lambs. If the flock is an established one, about a third of the ewes are culled out—mostly the oldest and those of doubtful character—and the flock replenished by shearing ewes that have been selected from the last year's lambs. If there be sufficient feed on the farm the culls are fattened, but they are sold if the feed is scarce. There is always a tendency to guard against over-stocking in autumn.

About the end of October the lambs are placed on the turnips. The turnips are topped and tailed with a knife and fork and thrown back in heaps. The part of the field cleared is fenced off by means of rope netting, and the sheep admitted. The turnips are cut into strips about the size of a finger with a revolving machine and fed to the lambs in wooden troughs. About $\frac{1}{2}$ lb. of linseed cake is given to each lamb every morning; a little barley is added during very cold weather. When spring comes the "he-hoggets" and the spare "she-hoggets" are sold, and though they are in high condition, scaling often 90lbs., they do not of necessity fall into the hands of the butcher. Farmers holding rich pasture land buy them, shear them, and sell the "he-hoggets" as wethers during July, August, and September, and the best of the "she-hoggets" are sold for breeding purposes.

When a flock has been established, if the owner has been careful as to the quality of the sheep, the best he-lambs are reserved for stud purposes, and very handsome profits are made. Purchasers come to the Lincolnshire ram sales from the uttermost parts of the earth. The owners make an exchange of the very best of their rams among themselves first; the rest are sold at auction or let out for the season.

Holder, November 10.

Present—Messrs. C. H. Perry (chair), H. Blizard, J. Green, F. G. Rogers, E. Crocker, W. Watt, W. Wood, J. H. Rossiter, and Jno. J. Odgers (Hon. Sec.).

MELONS.—Members find that virgin soil is best for growing melons.

FINANCE AND CULTIVATION.—Mr. E. Crocker read a paper on the above subject. The following is the substance:—

Last year he had read a paper advocating the keeping of accounts by farmers, so that they might always know their financial position, and learn which lines of their enterprise were profitable and which otherwise. He now proposed, with the aid of extracts from other writers, to continue the subject. There is not much trouble to get on to the land, but often a difficulty in making a living on it. Not every one is competent to become a very successful farmer. In any case, it is necessary that the situation and climatic and other conditions are suitable; that the farmer shall be possessed of energy and perseverance; and have a certain amount of cash with which to carry on. If the locality is almost continuously subject to drought, nothing but ultimate failure can be expected. But, having good soil in a locality

avored with sufficient rainfall, it will be found that "cultivation" is needed—not merely turning the sod once and then putting in a crop and leaving the rest to nature. The soil must be thoroughly prepared, sown, harrowed, and cultivated, else the crops will not be as abundant as they should be. Farmers may differ with regard to the depth of ploughing, quantity of seed to sow, harrowing of growing crops, or of using particular manures, but all practical men are agreed that the soil must be thoroughly cultivated to ensure success. The necessity for cultivation is more prominently recognised in connection with orchard and vineyard work. Rainfall or means for irrigation must be considered in this connection, as well as soil and situation, but the results are very apparent where the occupier fails to continuously cultivate his soil. In America the farmers for a time left off pig-breeding to a considerable extent and went in for wheat "bald-headed," but they found that this did not altogether pay, and now the pig is again taking its proper position amongst the farm products. South Australian farmers will find it to be to their advantage to combine several branches of production, so as to obtain fair remuneration for their labor. But attention to the money side of the question is quite as important as anything connected with cultivation. As the outcome of labor expended on any work or product, or cash laid out in the operation, there must be something resulting over and above the cost of the product, else the work will end in failure and ruin.

Colton, November 3.

Present—Messrs. P. P. Kenny (chair), W. J. Packer, E. Whitehead, W. A. Barnes, R. Hull (Hon. Sec.), and one visitor.

WEED.—Mr. Packer reported presence of a new weed on last year's cultivation paddocks. Neither sheep nor cattle would touch it, and the burs were injurious in the wool. It had taken complete possession of 200 acres of land. To be sent to the Central Bureau for identification.

DAIRYING.—The question of purchasing a pure-bred bull of approved dairying strain for use in the district was again considered, and it was decided to let the matter stand over until the end of the summer.

Kapunda, November 3.

Present—Messrs. W. Flavel (chair), W. M. Shannon, J. O'Dea, T. Scott, J. H. Pascoe, Pat. Kerin, and G. Harris (Hon. Sec.).

SEED WHEAT.—Owing to the prevalence of wild mustard ("Charlock") in various places, Mr. W. M. Shannon said that farmers should be careful to clean all wheat before sowing their seed. Mr. Flavel said there are large numbers of field poppies growing in wheat paddocks around Kapunda.

Naracoorte, November 10.

Present—Messrs. S. Schinckel (chair), E. C. Bates, A. Johnstone, E. R. Peake, and B. S. Roach (Hon. Sec. *pro tem*).

HOMESTEAD MEETING.—This meeting was held at Needwood, the farm of Mr. P. L. Schinckel. Mr. S. Schinckel took the members over this estate, which is one of the best in the district. The chaff-cutting business is fairly extensive, and the works for cutting and bagging complete. A good deal of hay is grown on the farm, and some is bought from other farmers. An acre of kale was seen in growth, some of it forced to seed by the hot weather. This is much liked by the live stock, and is used chiefly used for cows. The soil is chiefly rich fat loam, inclined to be heavy, and needs a deal of working in order to get the best results. The higher lands are sandy, covered with stringybark and bracken ferns. Several varieties of potatoes are grown experimentally, but so far do not promise great results. White mustard did well on two acres, and supported 100 sheep through the winter. The loaned bull, Royal

Progress, was well kept and in excellent health and condition. Mr. Peake mentioned that about thirty-six years ago some of this Naracoorte land produced a crop of 40bush. of wheat per acre.

NOXIOUS WEEDS.—Mr. B. S. Roach read a paper to the following effect:—

A "weed" is any plant that is out of its proper place. If wheat plants were found growing in a field of poppies grown for commercial purposes, the wheat would be regarded as weeds, and *vice versa*. Poisonous plants were weeds under all circumstances. Some plants were weeds in one district and not in another. At present it requires a resolution to be adopted by both Houses of Parliament before any plant can be proclaimed as "noxious within the meaning of the Act." This is a clumsy method, as the proclamation applies to all parts of the colony, whilst a plant may be noxious in one part and not in another. Weeds which in the South-East overrun and smother more useful herbage might be regarded as beneficial when moderately abundant in the dry North. Another defect in our legislation was that it does not recognise the fact that "prevention is better than cure." Whenever a weed was first recognised by expert knowledge as dangerous there should be power given to the local governing body to compel its immediate eradication. He noted that stinkwort was making its appearance in the district, and as the soil and other circumstances were favorable it would soon obtain such a hold that it would cost a large amount to eradicate it unless taken in hand speedily. It is most difficult to secure convictions before magistrates for harboring noxious weeds, the offenders getting off through technicalities. The Act is prone to deal lightly with offenders, as one clause gives justices power to suspend convictions. Again, it is a most difficult matter to get noxious weeds proclaimed. The Cape marigold [*Cryptostemma calendulacea*, wrongly called "dandelion."—GEN. SEC.], although by some in the northern districts regarded as a good fodder plant, upon good soil crowded out more useful plants that would last through summer in the south-eastern parts. The Cape flat weed [*Hypochaeris radicata*, really a native of Britain, and popularly called "cat's ear."—GEN. SEC.] is also regarded as a fodder plant, but it elbows out indigenous fodder plants that will stand the hot sun better. He also referred to the water hyacinth, which, on being introduced into rivers and lakes in Florida, increased to such an extent as to completely block out steamer traffic. This has been introduced also into waters in Queensland and New South Wales, and was already causing trouble. The Cape marigold was introduced in packages of Cape wines, and some early German colonists brought the stinkwort for smoking hams and bacon, as they did in their fatherland.

NARACOORTE AGRICULTURAL SCHOOL.—After partaking of tea at Mr. Schinckel's the members paid a hurried visit to the school agronomical plots, cultivated by seven pupils under the superintendence of Mr. B. S. Roach, the head master. On the low sandy places the wheat was choked by sorrel, but on the slope of the hill a number of interesting experiments have been conducted by the students under Mr. Wittber's direction. There are twelve adjacent plots, each of a rod square, sown with Dart's Imperial wheat. Three test plots were left unmanured, and the other nine were fertilised with one or other of the following manures:—Bonedust, muriate of potash, sulphate of ammonia, guano super., nitrate of soda, bone super., and mineral super., in varying proportions. The effects were most striking as between the manured and unmanured plots.

Golden Grove, November 8.

Present.—Messrs. J. R. Smart (chair), A. Harper, J. Woodhead, J. Anderson, A. Robertson, R. Smith, J. Ross, F. Buder, J. R. Coles (Hon. Sec.), and three visitors.

POTTING BUTTER.—Mr. Ross wanted to know best time to pot butter. Members said when the spring flowers are out; in this district during October and November.

OLD AND NEW SEED.—Mr. Buder initiated a discussion on the use of old *versus* new seed. Plants from new seed would often start well and make better growth at first, but in the end the result is not so satisfactory as from old seed. Cabbage, cauliflower, turnip, onion, and similar seeds should not be kept more than five years; but runners, like the members of the melon family, are better from seed from five to ten years old. Considerable discussion ensued, the subject being, in a sense, new to members, most of whom admitted having thrown away seeds a few years old as being useless.

Meadows, November 5.

Present—Messrs. W. Pearson (chair), J. Catt, G. T. Griggs, G. Rice, F. Buttery, T. B. Brooks, F. W. Dohnt, J. W. Stone, F. W. Vickery, D. D. Murphy (Hon. Sec.), and two visitors.

EXPORT OF APPLES.—Mr. Griggs read paper on this subject. He had sent through an Adelaide firm to Java 100 cases of apples which netted 5s. 6d. per case. Had he sold these locally he would not have got 2s. 6d. per case. The fruit was not equal to the standard required by the Export Department for apples sent to the London Dépôt. The varieties consisted of Stone Pippin, Cleopatra, Adam's Pearmain, London Pippin, Scarlet Nonpareil, and Reinette du Canada. He suggested that exporters should adopt two different width of cases, one 7in. and the other 8in., in order to facilitate packing of different size fruits.

Onetree Hill, November 2.

Present—Messrs. Bowman (chair), F. Bowman, G. Bowman. W. Kelly, A. Thomas, and J. Clucas (Hon. Sec.).

IMPROVEMENTS IN AGRICULTURE.—Mr. G. Bowman read a paper by Mr. T. H. Stevens on this subject. The writer contended that, notwithstanding the strides made of late years in the improvement of agricultural implements, there was still room for the invention of an implement that would more thoroughly break up the land than those at present in use.

FARM GATES.—Mr. F. Bowman tabled rough sketch of gate made of gas-piping, and explained its manufacture.

GLEN EWIN.—On the 6th November several of the members paid a visit to the Glen Ewin orchard and factory, and were hospitably entertained by Mr. and Mrs. McEwin. Considerable discussion on various matters connected with fruit-growing took place during and after the tour of inspection. Mr. McEwin made out a strong case for the cultivation of apricots instead of wheat where climatic conditions were favorable. The spacious jam factory was carefully inspected, and particular attention was also given to Mr. McEwin's Jersey cattle, many of which had won prizes at Adelaide. A cordial vote of thanks was accorded to Mr. and Mrs. McEwin for their hospitality, and the opinion expressed that the Bureau meetings could not take a more valuable form than that of inspection of orchards and homesteads such as Mr. McEwin's.

Wandearah, November 5.

Present.—Messrs. G. Robertson (chair), J. Wall, W. Roberts, W. Munday, E. Jacobs, S. Stanley, E. H. Eagle, and C. E. Birks (Hon. Sec.).

THE HEADER.—Mr. Eagle advocated the use of the header on small farms. In growing wheat for market he considered the damp weather stripper the best harvester, but as the profits from wheat-growing had been reduced to a minimum, they must devote attention to other lines of production. The conservation of fodder played a most important part in the keeping of stock of any kind, and he considered the header had many advantages to recommend it. The same quantity of wheat would be obtained if the crop is bound and headed as if stripped, besides which there is less risk of damage, as the crop can be harvested at least ten days earlier. Then when the crop is stacked the work is done with until the busiest season is past. In an average crop, if cut when the earliest of it was just on ripe, the later portion would ripen in the stook, or if too green, the grain would not be lost, as it would considerably increase the

value of the straw for feeding purposes. Then, again, if the land is required for a crop or for fallow the next year, the binder removes the stubble, leaving the ground ready for the plough. Where the crop is large enough, the thresher is preferable to the header. In feeding straw to cattle it was better to chaff it and mix a little bran and other food with it.

Watervale, November 5.

PRESENT—Messrs. C. A. Sobels (chair), J. Thomas, H. Scovell, G. Holder, G. Hunter, S. Solly, B. Perrin, W. Smith, E. W. Castine, H. Beck, and E. Treloar (Hon. Sec.).

KEEPING APPLES.—The chairman reported having, as an experiment, left some apples on a Rokewood tree until the end of July, but found those picked at the usual time were much superior.

BREEDING LAMBS FOR EXPORT AND FARMING.—Professor Lowrie gave an interesting address upon this subject, dealing also with the use of fertilisers.

ASPARAGUS BEAN.—Mr. Hunter reported having grown the asparagus bean to perfection, some of the fruits being a yard long, but they were of little value as a vegetable, and he could not recommend their cultivation.

SLUGS AND CATERPILLARS.—Mr. Smith reported that the slugs were very destructive to young plants. They had in one night destroyed more than half the young tomato plants in a large bed. The chairman reported night-feeding caterpillars eating the newly planted vines, and advised use of Paris green, bran, and treacle mixture.

Amyton, November 1.

Present.—Messrs. Jno. Kelly (chair), Jno. Gray, W. Gum, A. Gray, Jas. Gray, Thos. Gum, H. Gray, H. Turner, W. Hawke, W. Hughes, and S. Thomas (Hon. Sec.).

CONGRESS.—Delegates to Congress reported on proceedings of same, also on visit to Roseworthy Agricultural College. Members considered no benefit had resulted this year from the application of fertilisers to wheat crops to this district.

CLEANING WHEAT.—Mr. Hughes read a paper on this subject to the following effect:—

At one time South Australian wheat brought 2s. per quarter more than other wheats in the London market, but unfortunately we have lost all this advantage, and are now on par if not below some wheats. He believed this was mainly due to two causes, first, the farmers have not taken sufficient care to clean their wheat properly, and secondly, the buyers have been to blame for accepting samples they should not have done, and for not grading, and encouraging the farmer who cleans his wheat thoroughly. He believed, if they were to regain their reputation, they must alter the present system of cleaning, as the merchants seemed to be determined not to alter their present methods of buying. If all farmers interested in the Bureau and the Farmers Co-operative Union were to take the matter in hand, and insist on their wheat being thoroughly cleaned, there would soon be a decided improvement in the quality of our wheat, and those that were careless would not, as at present, be on a par with the careful cleaner. He believed that with plenty of good samples available the buyers would be more careful, and that the raising of the quality would soon result in the price improving. One only needed to go to a flour mill to see the enormous quantity of rubbish that comes out of the wheat before it is ground. Surely it would be better if this were left on the farm. There can be no excuse for bad cleaning with the improved winnowers now obtainable. Some attention is, however, necessary in the field. A good floor is required on which to empty the stripper, and not put it anywhere in the stubble, as he had sometimes seen it done. Care should be taken when coming to the heap with a load not to tear up the ground with the steering wheel, and a good broom should be at hand to sweep away any dirt that works up from the traffic. The man feeding the winnower should be careful to keep a good heap of

cavings under his feet to prevent his breaking up the ground. When shifting the machine push back the wheat on the floor with the back of the rake, and there will be but little dirt. The rest should be swept up and kept for fowls, and not put into the heap, as is sometimes done. Put the winnowers to work as early as possible, as the weather is generally more settled than later on, and the grain will lose in weight and color if left lying about too long. Do not have cleaning done by piecework. This means quantity regardless of quality. If men are paid fair wages, and work reasonable hours, there should be no difficulty in getting them to work by the week, nor in getting value for the wages paid. The wheat that the farmer intends to keep at home for a time should be run through the coarse sieves, and carted into the barn, and emptied on to the floor. It saves buying bags until actually needed, and there is but little damage by mice in the loose wheat.

Members generally agreed with the paper, but thought the buyer was not concerned in the grading or in keeping up the price, his object being rather to buy as cheap as possible and sell at the best price he could obtain.

DESTRUCTION OF RABBITS.—Members wished to know best and most effective way of destroying rabbits. A member asked for the best manner of dissolving strychnine and arsenic for preparing poisoned baits, also quantities to use. [The following methods have been recommended by Branches:—Strychnine, dissolve 3lbs. to 4lbs. sugar in 2galls. water; add 2lbs. flour made into a nice smooth paste; dissolve 1oz. pure strychnine by boiling in half-pint of good vinegar, and mix all well together. Dip in twigs of sandalwood (or instead of sandalwood add sufficient pollard to make a thick paste) and lay about logs, burrows, &c. Strychnine and water—Dissolve a quarter of a cup of tartaric acid in half a cup of boiling water, and dissolve a dessertspoonful of strychnine in this liquid. Dissolve 4lbs. of sugar in 5galls. of water and add to the above liquid. This is to be placed in dishes in fenced-in watering places. Arsenic—Boil 1lb. arsenic, 1lb. washing soda, and 2lbs. sugar in 2galls. water for ten minutes, then stir in pollard or wheat until a proper consistency is secured.—GEN. SEC.]

Renmark, November 8.

Present—Messrs. W. H. Walters (chair), R. Kelly, F. S. Wyllie, C. Millar, S. R. Cox, H. Forde, Captain Moffatt, H. Swiney, M. Chapman, and E. Taylor (Hon. Sec.).

PHYLLOXERA.—Mr. Henry Lowcay, Government Inspector of Vineyards, forwarded a lengthy and very interesting paper on "Phylloxera," which was published in the *Renmark Pioneer* of November 2. The following is a condensation:—

Phylloxera vastatrix is a native of North America, where it lives on the wild grape vines without particularly damaging them. In 1863 it was first detected in Europe, and soon spread through the vineyards in every direction. It is calculated that it has inflicted damages equal in value to £200,000,000 in France alone. It spread to Corsica, the Rhine, Switzerland, Spain, Portugal, Austria-Hungary, Italy, Greece, and reached Victoria (Australia) in 1878. Then Algeria and Cape Colony became affected. In 1885 it was found in New Zealand [and also in New South Wales about that time—GEN. SEC.]. To prevent its effects at Renmark and Mildura, the introduction of cuttings, &c., must be effectually prohibited, and every colonist should be constantly on the watch and report at once any suspicious appearances about any vines, so that there may be an opportunity to *at once stamp the pest out*. At present, South Australia is entirely free from phylloxera. After the insect has been feeding on the juices of the vines for a short time, the growth becomes stunted, and the leaves are less plentiful. Later on the shoots become weakly, short, and shrivelled, the leaves turn yellowish or reddish-brown, the edges curled back and withered, the bunches are asserted in growth and the skin wrinkled. Next season the effects are much more apparent, and finally the vine dies. The rootlets will be found to have numerous swellings upon them, first yellowish and later brown and rotten. A number of minute dingy light-yellowish to green-yellowish insects will be found clustered near these nodules. These are the aphides, called *Phylloxera vastatrix*, some of which find their way to foliage and become winged. The wings are twice as long as the

body, strongly ribbed, and have a longitudinal yellow stripe; the body of the flying insect is golden yellow at first, but changes to a deep orange later on. They are carried with the prevailing winds about end of December here, and probably continue to be in evidence for six weeks or longer.

TOPPING VINES.—Mr. Lowcay, on being consulted, informed the Hon. Secretary that he is opposed to the practice of cutting off the tops of vines whilst growing; but if they are growing too strongly he would pinch off the terminal buds.

PRUNING.—Mr. Forde said last winter he had seen a number of vines pruned with a tomahawk, instead of saw and seccateur. Was this a commendable practice? Members were unanimous in condemnation of this barbarous tool, and agreed that the long-handled shears and saw are the proper tools for cutting large wood and the seccateur for smaller canes.

RABBITS.—These are becoming a great pest in this locality. Large quantities of phosphorised pollard and of strychnine and sandalwood twigs are being used without much apparent effect in reducing numbers. Several men are making good wages in killing rabbits.

SUPERPHOSPHATE.—Some members broadcast their super. and scarify it under; others have it dropped into the furrows after the plough. For vines and fruit trees some contrivance is required to drop the manure at the heel of the plough, so that it can be covered by the next furrow.

Millicent, November 8.

Present—Messrs. S. J. Stuckey (chair), B. Varcoe, H. A. Stewart, W. R. Foster, W. J. Whennen, R. Campbell, H. Oberlander, H. Hart, H. F. Holzgreffe, and E. J. Harris (Hon. Sec.).

WEEDS.—Several varieties of weeds are gaining ascendancy in this district, amongst them being stinkwort, which it was recommended to check. Mr. Hart directed special attention to *Homeria collina*, which has spread in Yankallilla district, and said it would be well to find out something about it in case it should find its way to Millicent. [Read the latest previous issue of this journal.—GEN. SEC.]

RECIPES.—The following were handed in by members:—*Azle Grease.*—One part each of Stockholm tar and castor oil and two parts mutton tallow, mix by heating and stir well when cooling. One member recommended adding a little kerosine, in which case a little extra tallow would be required. *Dubbing for New Boots.*—Two parts of tallow to one of beeswax. Rub well in while warm.

EAR MARKS BILL.—Members favor fire branding of sheep sold out of pound as well as of other stock.

Eudunda, November 5.

Present—Messrs. J. von Bertouch (chair), H. D. Weil, E. T. Kunoth, C. Wainwright, F. W. Paech, M.P., A. J. Kluske, J. A. Pfitzner, A. M. Twartz, W. H. Marshall (Hon. Sec.), and one visitor.

WEEDS.—A general discussion ensued on the prevalence of flowering weeds this season, and as to whether they were really harmful to the wheat plant.

AGRICULTURAL EDUCATION.—The Hon. Secretary read paper on this subject from the *Chronicle*, and a good discussion ensued. It was agreed by all present that if farmers are to fit their children for successful farm work they must give them the best practical education possible,

DAIRYING.—Considerable discussion took place on the question of purchasing a pure-bred bull of approved dairying strain, and the Hon. Secretary was instructed to ascertain cost and particulars.

ATTENDANCE.—The Hon. Secretary was asked to specially interview those members who failed to attend the meetings, with a view to inducing them to attend regularly or make way for others.

Burra, November 9.

Present—Messrs. F. A. S. Field (chair), E. Goodridge, Jos. Flower, A. McDonald, James Arnold, F. Duldig, Hon. J. Lewis, M.L.C., R. M. Harvey (Hon. Sec.), and one visitor.

COMMERCIAL FERTILISERS.—The Chairman pointed out that the report in the November issue of the *Journal of Agriculture* in regard to use of Thomas phosphate was rather misleading. What Mr. McDonald said was that Thomas phosphate was giving better results than was expected, not that it was equal to mineral super.

LOCUSTS.—Mr. Duldig reported that locusts were doing great damage to the wheat crops at World's End, and he found it very difficult to destroy them. The Chairman advised members to try the remedy recommended on page 386 of November *Journal of Agriculture*.

ANNUAL MEETING.—It was decided to hold the annual meeting after harvest, when members will be expected to bring in report for their district for the preceding six months. It was the opinion of those present that it would be a very good thing if all Branches of the Bureau could hold their annual meetings about the same time of the year.

WOOL-CLASSING.—Mr. Geo. Jeffrey is expected to start his class at the Burra early in the new year. A number of fleeces from different parts of the district have been saved for the use of the students.

Caltowie, November 5.

Present—Messrs. A. Kerr (chair), A. McCallum, J. G. Lehman, J. Neate, J. A. Leahy, J. Potter, E. M. Wilson, G. Petatz, J. Noonan, and A. McDonald (Hon. Sec.).

TRIAL OF REAPERS AT CRYSTAL BROOK.—Mr. McCallum, who was one of the judges at the recent trial of reapers at Crystal Brook, reported that the damp weather strippers had to reap two acres of an even crop, and be drawn with three horses. While points were allowed for clean work, threshing, and lightness of draught, construction and adjustment were also taken into consideration. The test was severe, and May Bros. secured the award. In ordinary reapers Dignan's secured the award by cleaner work and better threshing, but had a tendency to crack the grain. Mr. McCallum considered that while a good deal of alteration and improvement had been made during the past twenty-five years in the adjustment and construction of reapers, he failed to see a corresponding improvement in the actual work of the stripper itself, especially in the direction of saving the grain and in the threshing. He realised the importance of these field trials, and if only makers would see their way to compete much good would be done. The Crystal Brook Association were to be complimented upon their energy, and he hoped they would be successful. They could with advantage form a similar association in this district.

MANURED CROPS AND DRY WEATHER.—Mr. Petatz tabled sample of Smart's wheat, manured with mineral super., which had been blighted by the

hot winds, an inferior sample being the result. At one time it promised at least 20bush. per acre., but it had gone off very rapidly, which he attributed to the use of the fertiliser, as the unmanured crops were not so affected. Other members had noticed a similar tendency, but considered it somewhat early to pronounce any decided opinion. [When only portion of the crop suffers in this way, whether manured or not, it would be well to note the special conditions at the time hot weather or cold winds occur, as it is well known that wheat is much more susceptible to injury at one stage than another, and it often happens that a paddock only a few days earlier or later than an adjoining lot will escape damage, while the other is injured. If a note is taken as to whether the wheat is just coming into ear, or flowering, or in the milky stage of the grain, it will often explain the different behavior of the crops.—GEN. SEC.] Members reported on the condition and prospects of the crops. In several cases the crops showed the effects of the hot winds, while in others they were said to be exceedingly promising. The hay crop has been exceedingly good.

Mallala, November 5.

Present—Messrs. G. Marshman (chair), S. Temby, A. F. Wilson, F. M. Warden, J. McCabe, M. H. East, J. Jenkins, G. W. Bischof, W. Temby, R. Butler, M.P., J. Nevin, W. R. Stephenson (Hon. Sec.), and one visitor.

DEATH OF MEMBER.—It was decided to send a letter of condolence to family of the late S. Churches, who had been a member of the Branch and an active worker since its inception.

NEW WHEATS.—Mr. Wilson tabled sample of Marshall's Hybrid wheat, grown from Bureau seed. It was taken from a fairly good crop, and in the opinion of members contained several different varieties. [This is a new cross, and, like all such sports, to a considerable extent partaking of the characteristics of either or both parents. If worth growing, only the best and typical heads should be saved for seed. The true type is not bearded.—GEN. SEC.]

AGRICULTURAL COLLEGE.—During the month members paid a visit of inspection to the Roseworthy Agricultural College farm, under the supervision of Professor Lowrie, a very interesting day being spent and a large amount of useful information elicited from the professor. Mr. Nevin reported on this visit, and considerable discussion ensued on the practices adopted and the results obtained at the College farm. Members consider 1cwt. of fertiliser per acre, with thorough and judicious working of the land, sufficient. They would have liked to have seen a few of the later varieties of wheat grown at the College as well as the earlier kinds.

Mount Gambier, November 10.

Present—Messrs. M. C. Wilson (chair), T. Edwards, J. C. Ruwoldt, D. Norman, sen, W. Mitchell, Jas. Bowd, J. Dyke, T. H. Williams, W. Barrows, G. Bodey, and E. Lewis (Hon Sec.).

CONDOLENCES.—All members spoke in high terms of appreciation of the life work of their late Chairman, Mr. James Umpherston, and the Hon. Secretary was requested to send a letter of condolence to Mrs. Umpherston.

NUT GRASS.—Hon. Secretary reported occurrence of the dreaded nut grass on the property of Mr. Tolner, at Compton. [This plant was described and illustrated in the *Journal of Agriculture* of December, 1899, page 428, and further referred to in last month's issue of this journal.—GEN. SEC.]

WEEDS.—Mr. Dyke mentioned a red-flowered weed which was spreading at Myora and elsewhere. Mr. Edwards thought it would not do much harm, as it died down early in the season. [This is most probably the field poppy, which in some places covers large areas of good land to the detriment of crops and herbage.—GEN. SEC.] Mr. Edwards also said people at Millicent thought the star thistle a scourge, but he had a paddock of it at Millicent, and he knew that it carried four times as many sheep as any of the others. [Mr. Edwards has most probably mistaken some other plant for star thistle, because he afterwards admitted that the cockspur thistle is much worse than the thistle he alluded to.—GEN. SEC.] It was mentioned that *Homeria collina* (very poisonous and extremely prolific) is commonly grown in gardens about Mount Gambier.

BOTFLY.—A discussion arose with respect to the botfly, the warble-fly, and the gadfly, in which some misleading ideas were enunciated. [The botfly deposits eggs on the horse which cause a tickling sensation, and the horse licks them off, when they get into the stomach and cause bots. The warble-fly belongs to the same genus, but the eggs produce maggots on the skins of cattle, which eat their way through the skin and cause abscesses to occur, which are called "warbles." The gadfly is a bloodsucker, which neither causes bots nor warbles. There are at least two species of this indigenous to South Australia, and they are very common from spring until end of autumn. It has been asserted that tansy decoction will destroy bots in the stomach of the horse.—GEN. SEC.]

TUBERCULOSIS.—Inspector Williams said he had discovered five cases of tuberculosis in the udders of cows since last meeting, and in one or two cases he had no doubt inoculation had arisen from the hands of the milker. He showed tubercles from the intestines of a cow and the liver of a fowl. When fowls get the disease they waste till nothing but skin, bones, and feathers remain. Sometimes they have diarrhoea, and spread the infection by means of their excreta. At a recent medical conference in Germany it was stated that 50 per cent. of all deaths were from consumption. There are 10,500 milch cows in the South-East, and a bacteriological laboratory is much required.

Cherry Gardens, November 13.

Present—Messrs. T. Jacobs (chair), C. Lewis, G. Brumby, G. Hicks, and C. Ricks (Hon. Sec.).

SEASON.—Members reported hay crops light, also potatoes, though the rain during the past week will do the latter some good. Caterpillars of various sorts are very plentiful, and in many cases the potato crops are being stripped by a small green caterpillar. A brown caterpillar is doing immense damage to everything green. The Paris green bran and sugar mixture is being used to destroy the insects.

Forster, November 12.

Present—Messrs. J. Johns (chair), J. Sears, W. Johns, F. Johns, C. Bolt, A. Schenscher, J. Childs, F. Towill, J. Retallack, W. Sears, J. A. E. Schenscher (Hon. Sec.), and four visitors.

WHITE HEADS IN WHEAT.—Discussion on cause of white ears in the wheat crops took place. Mr. F. Towill thought it due to the roots perishing,

but Mr. Bolt thought that as the stems remained green while the heads dried off, rotting of the roots could not be the cause. He thought it due to the effect of frost.

WHEAT EXPERIMENTS.—Members reported that wheats received from Central Bureau, viz., Ranjit, Marshall's Hybrid, Silver King, and Majestic, proved unsuitable for this district, being too late and too thin in the straw.

HARVESTING MACHINERY.—A long discussion ensued on the merits of different makes of strippers, winnowers, and other harvesting machinery.

Tanunda, November 8.

Present.—Messrs. J. H. Walden (chair), J. Gurr, G. Mann, W. Graetz, P. Trimmer, E. Trimmer, A. Ohlmeyer, and C. Heineman (Hon. Sec.).

INSPECTION OF VINEYARDS.—Members were of opinion that the inspector appointed by the Phylloxera Board should have completed his inspection of the vineyards in the principal vine-growing districts before visiting the Far North.

AGRICULTURAL COLLEGE. Members paid a visit of inspection to the Roseworthy Agricultural College, and were shown round the crops by Professor Lowrie, who explained the nature of the cultural operations adopted in connection with the various experiments being carried on. The manure tests came in for much inquiry. The condition of the orchard and vineyard proved the locality unsuitable for growing vines and fruit trees, and members regretted that Professor Perkins had not more favorable conditions to work under.

Orroroo, November 16.

Present.—Messrs. W. S. Lillecrapp (chair), G. Harding, R. Coulter, jun., and T. H. P. Tapscot (Hon. Sec.).

BUNT EXPERIMENTS.—The Hon. Secretary reported on some experiments with bunt in wheat. He obtained sixty-six perfectly clean grains of wheat and a few "smut" balls, and rubbed them together until all the grains were thoroughly covered with spores. He then pickled half in bluestone water and sowed them side by side with the unpickled grains. Of thirty-three grains of infested wheat unpickled thirty-two germinated and grew; twenty-five plants were bunted and seven clean. Of the thirty-three pickled seeds twenty-three grew, and only one was bunted. Out of thirty-seven grains of clean wheat sown alongside, thirty-six grew and only one was affected by bunt.

VISIT TO HOMESTEAD.—On October 24 eight of the members, accompanied by their wives, paid a visit of inspection to the farm of the Hon. Secretary in the hundred of Coomooroo, near the Lubra Springs. A careful inspection of the homestead and farm was made. Everything showed signs of care and attention and pride in keeping the place clean and neat. Considerable experiments with different wheats are carried out by Mr. Tapscott, the plots ranging from a few square yards in area up to half an acre. The severe season and the grasshoppers had somewhat spoiled the appearance of the crops. Considerable discussion took place on the merits of the different wheats, after which the well-kept orchard and garden were inspected. The small but beautiful flower garden and the dairy came in for very favorable comment. The visitors were entertained by Mr. and Mrs. Tapscott, who were suitably thanked for their hospitality.

Crystal Brook, November 10.

Present—Messrs. J. C. Symons (chair), W. J. Venning, A. Hamlyn, P. F. Claridge, W. Hamlyn, M. Weston, G. Davidson, and F. S. Keen (Hon. Sec.).

FIELD TRIAL OF STRIPPERS.—The Committee reported on field trial of wheat-stripping implements, held October 31, on the farm of Messrs. Miller and Sons, Rocky River. Mr. G. Davidson acted as Hon. Secretary. Fifteen strippers were entered and thirteen contested. The following table shows the classes competed in, the judges in each class, the points gained by each machine:—

Crystal Brook Field Trial, October 31, 1900.

	Clean Reaping.	Best Thrashed.	Best Filled Box.	Straightest Draught Behind Horses.	Construction.	Supplcity of Adjustment.	Workmanship.	Best Steering Arrangement.	Least Cracked Grain.	Lightest draught as Tested by Dynamometer.	Totals—Points.
--	----------------	----------------	------------------	------------------------------------	---------------	--------------------------	--------------	----------------------------	----------------------	--	----------------

CLASS 1.—DAMP-WEATHER STRIPPER.

Judges—Messrs. W. H. Binney, A. McCallum, Geo. Sandow, V. Tyler, F. Wheaton.

Possible points	50	50	50	50	50	50	50	50	50	50	500
Entries—											
May Bros'. Premier	40	43	50	41	43	43	50	41	47	44	442
“ Climax	35	43	50	41	43	43	50	41	47	45	438
Dignan	38	45	50	40	50	43	50	41	22	30	409
Mellor	23	20	39	41	38	43	44	41	47	30	366

Judges awarded first and second prizes to May Bros.

CLASS 2.—ORDINARY STRIPPER.

Judges—Messrs. W. H. Binney, A. McCallum, V. Tyler.

Possible points	30	30	30	30	30	30	30	30	30	30	300
Entries—											
Dignan	22	27	26	28	29	25	29	26	28	22	262
May Bros.	18	27	28	26	25	25	29	26	28	24	256
Mellor	15	20	23	26	24	23	20	26	28	21	224

Judges awarded first prize to E. P. Dignan, second prize to May Bros.

CLASS 3.—PONY DAMP-WEATHER STRIPPER.

Judges—Messrs. P. Spain, A. Kirk, and A. Inglis.

Possible points	30	30	30	30	30	30	30	30	30	30	300
Entries—											
May Bros.	30	30	28	26	27	27	30	24	30	27	279
Lawry	27	30	28	24	28	24	28	25	23	26	263
Dignan	24	30	22	24	30	26	30	24	30	18	258

Judges awarded first prize to May Bros., second prize to R. Lawry.

CLASS 4.—PONY ORDINARY STRIPPER.

Judges—Messrs. W. H. Binney, A. McCallum, V. Tyler.

Possible points	30	30	30	30	30	30	30	30	30	30	300
Entries—											
Lawry	24	24	27	26	29	24	29	26	30	25	264
Dignan	24	29	27	27	28	25	30	26	19	23	258
Mellor	24	21	27	26	24	24	26	26	30	24	252

Judges awarded first prize to R. Lawry, second prize to Dignan.

Visitors generally expressed the opinion that such field trials are great factors in development of new inventions to help the farmer in securing cleaner ingathering and thrashing of his crop. Machinery which costs the least and does the best work in the field must help to place the farmers' balance on the

right side. The Committee felt that, in order to do strict justice to such field trials, there should be judges for each class, so that the crops could be carefully examined prior to work being commenced to ascertain what quantity of grain has been shaken out of the ears, and, after the work is done, to find out what has been lost or wasted by each machine, besides watching the work of the machines during the contest.

Appila-Yarrowie, November 9.

Present—Messrs. P. Lawson (chair), C. W. H. Hirsch, A. Fox, J. H. Bottrall, N. Hannagan, W. Stacey, J. O'Connell, J. H. Klemm, E. Catford, W. C. Francis, J. Daly, and C. G. F. Bauer (Hon. Sec.).

BRANCH SHOW.—Matters in connection with the proposed show of home industries to be held in connection with this Branch in March or April, 1901, were dealt with.

BINDER TWINE.—Members complained that the bales of binder twine were often from 2lbs. to 9lbs. less than the weight branded on them.

Minlaton, November 19.

Present—Messrs. T. Brown (chair), W. Correll, J. Martin, J. D. Mayer, D. G. Teichelmann, Jas. Anderson, and J. Correll (Hon. Sec.).

MANURES.—Mr. W. Correll said that he had noticed that crops manured with superphosphates containing an excess of sulphuric acid were more liable to become scorched by the hot winds than those grown with manures not so soluble.

NEW WHEATS.—The Hon. Secretary tabled a number of his new cross-bred wheats. Several have the Medea variety for one parent, and are very promising, and two of them are fixed. He has seven acres sown with a new selected variety, which is thought to be a natural cross between Medea and Old Purple Straw. This plot yielded 22bush. per acre last season, and the yield this year is expected to be about the same. Ranjit and Silver King wheats were also shown, and these he considered were very good. Marshall's Hybrid and Majestic were not so good, as they were more easily blighted by hot winds.

BUNT IN WHEAT.—Owing to a large quantity of wheat being destroyed by bluestone pickle, members propose washing the seed in water some time before sowing, so that the bunt spores will germinate and perish before the wheat is to be sown. Some members had already done this.

Arthurton, November 1.

Present—Messrs. W. H. Hawke (chair.), M. Lomman, W. Short, Job Pearson, C. L. Palm, T. B. Wicks, M. Baldock, J. W. Parker, T. Baldock, W. E. Hawke, H. J. Freeman, S. F. Lamshed, J. B. Rowe (Hon. Sec.), and six visitors.

HOMESTEAD MEETING.—This meeting was held at the residence of the Chairman. His numerous experimental wheat plots were inspected and came in for considerable attention. Some of the plots were of considerable area, others only in rows. Mr. Hawke explained the origin and characteristics of the various wheats being tried. A fifty-acre plot of World's Champion wheat looked well, and should prove a good hay wheat. Two years ago Mr. Hawke had only twenty-four heads of this wheat; the grain from these, when sown,

produced 40lbs., and from 40lbs sown last year, seven and a half bags were reaped, and this year fifty acres have been sown. Majestic wheat was very much nipped by hot winds and frost. Particular interest was shown in the inspection of the outbuildings, sheds, implements, &c. Mr. Hawke's farm is one of the most up-to-date in the district. An oil-engine is used for pumping, chaffcutting, corncrushing, and other work. Ample water for all requirements is provided by means of dams, some of which are of considerable size. After the inspection, members were entertained by Mr. and Mrs. Hawke, who were accorded a hearty vote of thanks for their hospitality.

FIELD TRIAL SOCIETY.—Delegates to the Northern Yorke's Peninsula Bureau Field Trial Society reported on proceedings of recent meeting. Their financial position was sound. They had received the grant of piece of land near Paskeville on which to hold trials, and the Paskeville branch will get the same fenced.

CO-OPERATION.—At the request of the members, Mr. A. Wight, of the South Australian Farmers' Co-operative Union, gave an address upon the aims and objects of the union. It was only started twelve years ago, and had done an enormous amount of work on very little capital. Losses had occurred, but this was not unusual with large business firms. It was desired to strengthen and enlarge the union, as much more could be done with their present staff. To put the union in the place it should occupy they must have more capital. The union did not get the full credit it deserved in improving the price of wheat at the various country townships, as the advent of the union usually resulted in the merchants giving a little more for the wheat in order to keep their customers from going to the union agent. A considerable number of questions were asked and answered, and those present pledged themselves to dispose of a certain number of shares in the district.

Inkerman, November 6.

Present—Messrs. Broad (chair), E. M. Hewett, D. Fraser, C. H. Daniel, C. E. Daniel, W. A. Hewett (Hon Sec.), and one visitor.

"FEED *v.* BREED."—Mr. C. E. Daniel read a paper to the following effect :—

At most of the Branches of the Bureau for some months now the main topic of discussion has been—how are we to improve the breed of our horses and cattle. Many have been the schemes brought forward to secure this end, and nobody knows where it will end, what with Government bulls, stallions, subsidies, licences, and veterinary surgeons' certificates. It seems as if some people want the Government to run the whole show; they evidently forget the motto in starting the Bureau of "helping those who help themselves." It will be a bad day for the farmers in general when every stallion open for hire must have a licence (it may possibly benefit a few), as whatever the owner has to pay for that licence, whether it be £5 or more, the farmers hiring the horse will have to make that up by paying a higher fee; and if the breed of the horse is to be taken into consideration before such licence is to be granted, who is to be the judge whether such horse is a mongrel or not? The definition of the word mongrel is—anything the local farmer breeds himself, no matter how good his antecedents have been for generations back. A horse costing eighty guineas or 100 guineas, bred in the South or imported from Victoria, raised in a lucern paddock or somewhere as good, and with a long pedigree leading off with "by Lord so-and-so," or the "Duke of something," from a dam equally distinguished, may really be so related; but how do we know what sort of horses the parents were? Just as likely as not they were inferior to our own; but feed works wonders. Well, these are the horses that are always patronised; these are also the horses that would be granted licences, where a local-bred horse, perhaps better in many ways, would be refused. I admit there are well-bred horses, and when we get stock from these it is generally above the ordinary class of horses, but to run after every flash-looking horse that is brought into the district is not to be advised. Some of the best horses in our district are by farm-bred colts that have had plenty of feed, and have never had their growth checked. We often see

foals taken away from their mothers and turned straight into the paddock to get their own living, with the result that they get pot-bellied. The growth of all young farm stock is checked once they get pot-bellied. Instead of troubling ourselves about Government stallions, licences, &c., rather let us feed our young stock better, get all the growth out of them we can, and by so doing we shall not go far wrong. One of the best ways to provide food for young stock is by getting in all the wheat chaff and some good straw. We have some straw on our place three years old, and this last winter the cattle ate nothing else for several days of cold wet weather. Young stock will keep fat through the cold wet months, when feed in the paddocks is scarce, if only provided with a stack of straw or heap of chaff.

Mr. Board admitted that "farm colts" sometimes got good stock; but in all probability they have been bred from first-rate stock. Other members agreed that it is important to look well after young stock, but did not allow that pedigree should be sacrificed.

Pyap, November 20.

Present—Messrs. J. Harrington (chair), B. T. H. Cox, C. Billet, E. Robinson, G. H. Mills, J. Holt, A. J. Brocklehurst, J. G. Arnold, G. Napier, J. F. Bankhead, J. Napier, W. C. Rogers (Hon. Sec.), and five visitors.

PEACH APHIS AND CURL-LEAF.—Mr. S. McIntosh, Village Settlements Expert, said fruitgrowers on the Murray, from Wahgunyah downwards, and even extending to Adelaide, will only be troubled with peach aphis and curl-leaf during a wet season. [Surely this statement is open to contradiction.—GEN. SEC.] He gave some particulars which apparently bore out his opinion. In well-sheltered places—especially where a sub-tropical muggy heat prevails—the aphis thrives well. Excessive watering during the hot weather will bring about the same result, when they will be found in great numbers on the trunks of the trees, and even to a depth of 3in. below the soil. The remedy is to remove the soil to a depth of 6in. from the trunk and swab the roots with tobacco and soap decoction—3ozs. of each in a gallon of water. He preferred resin compound for spraying the branches. From 1oz. to 2ozs. bluestone dissolved in a gallon of water will also do for swabbing the roots; or it can be poured on the loosened soil around the stem.

Port Elliot, November 17.

Present—Messrs. J. McLeod (chair), J. Brown, W. E. Hargreaves, J. R. Cootc, H. Welch, E. Hill (Hon. Sec.), and one visitor.

GRAZING.—Mr. Welch read the following paper on this subject, members being in general accord with the views expressed therein:—

Grazing is an industry which a person unacquainted with is liable to think may be carried on successfully by any individual; but experience teaches us that too much care and attention cannot be bestowed upon the manner in which we carry on this operation. Grazing should be carried on systematically just as much as cultivation, but to lay down hard and fast rules would not be possible owing to the great variety of soils and climatic conditions in this colony. I will confine myself to our own district, and endeavor to explain the mode which I find most profitable on our own farm—the manner in which I should suggest after about twenty-eight years' experience. First of all we have to consider the quantity and quality of the land to be grazed. We will commence with 160 acres. Should a portion of this land be of a moist nature and of fair soil it would doubtless pay to graze dairy cows on it, but if all is dry land I would keep a certain number of sheep and a few cattle. Cut the two sections up in four, six, or as many more paddocks as you like, changing your stock from paddock to paddock say once a month; change being very essential to the health of both sheep and cattle and to the profitable production of flesh. Sheep will feed very close on a cattle camp, and cattle love to graze on a sheep camp. Horses will feed after either. Should you desire to cultivate a portion of the two sections, let your sheep be put on that paddock at night; they will then improve the soil and clean the ground from weeds, there being few weeds which sheep will not destroy. Let us now pass on to

1,000 acres, as any intermediate quantity may be dealt with in a similar manner. This block I would at least cut up into ten paddocks; the plan of intersection must be arranged according to where the water lays and nature of country. If possible let there be water in each paddock. It is not advisable that sheep should have to travel even one mile for water. Should you not be able to secure water in each paddock, the next best plan is to reserve your feed where the water is for summer use. Upon this 1,000 acres I should keep cattle as well as sheep, probably a few dairy cows. Make a portion of this land good by camping the sheep on it at night; this use for the cows. Young cattle will live with sheep, as there is always some portion too heavily manured for sheep, and also some rough grass which is better for being fed down, especially as it is advisable to allow certain parts to seed. This should be where your fat stock are kept. Treat your 1,000 acres in a similar manner to the 160. Be careful you do not overstock, as by doing so you will find all your best grasses eaten out. Also, do not *continually* understock, as thereby you will find too much old grass causing the new, especially on hilly or poor land, to become sour and distasteful to stock, besides which it will not have the fattening properties of the shorter and sweeter feed. Each year it is well to leave sufficient dry grass to carry the stock on until July, when all the paddocks should be fed down fairly well, allowing a nice fresh growth to spring up. This will be managed by feeding so many paddocks down at a time, the last holding out until July. I would advise allowing certain portions to be free of stock about two months before the grass seeds, giving the good grasses a chance to increase as well as the indifferent. Rest your grasses; do not allow stock to be constantly nagging at them. Even a fortnight's spell will do good in the growing season. Clear your land from superfluous timber and bushes, but be sure to leave sufficient for shade in summer and shelter from bleak winds during winter. Use your hilly country for sheep and for change; don't be alarmed if some of your land is too salt for cultivation, this is very beneficial to all stock. I am convinced that if grazing is carried on in this style your lands will improve instead of becoming impoverished. This I have proved, as some fifteen years ago we were pleased to find fat sheep among our hill flocks, now we are surprised to find a poor sheep, *i.e.*, after being held six months.

Koolunga, November 1.

Present—Messrs. E. J. Shipway (chair), J. Button, W. T. Cooper, J. Pengilly, R. Lawrie, W. J. Jose, J. Butterfield, R. H. Buchanan, G. Cooper, G. Pennyfield (Hon. Sec.), and one visitor.

EXHIBITS.—Mr. Button tabled samples of swede turnips pulled over a month ago and buried in sand. They were as fresh as the day they were pulled. Mr. Jose tabled several samples of wheats grown from Bureau seeds.

Pine Forest, November 6.

Present—Messrs. R. Barr, jun. (chair), W. H. Jettner, J. Phillis, G. Inkster, J. H. J. Mudge, E. Masters, and F. Masters (Hon. Sec.).

PROBABLE AVERAGE CROP.—After much discussion, during which some startling cases were cited of damage to crops by frost and the dry weather of October, members decided that in their opinion the estimated average at previous meeting must be reduced fully one-third, and it will not exceed 4bush. per acre.

FROST-BITTEN WHEAT.—The Hon. Secretary said he had seen some ears of wheat reputed to have been frost-bitten. The head and some of the straw beneath appeared quite white and mature, but the straw was extremely brittle, while the grain was soft and shrivelled. The seed was quite useless for milling, but if it would do for seed it should not be wasted. Mr. Phillis said he had a crop twenty-five years ago which looked like 25bush. per acre, but it was frost-bitten, and he reaped only 6bush. The next year he sowed some of the seed, but it failed to germinate. Mr. Inkster and Mr. E. Masters had each sown similar grain, and it germinated all right. Mr. Jettner doubted that the wheat referred to was frost-bitten, and he had always understood that frost-bitten wheat would not germinate.

EXHIBITS.—The Chairman tabled the following wheats in the straw :—Carmichael's Eclipse and Allora Spring. The Hon. Secretary tabled Purple Straw, Hawke's Club, Majestic, and Marshall's Hybrid. The last is rust-resistant, strong, and has splendid heads.

Finniss, November 5.

Present—Messrs. J. Chibnall (chair), S. Eagle, H. Langrehr, A. E. Henley, A. Green, S. Collett (Hon. Sec.), and one visitor.

SEED EXPERIMENTS.—Mr. Heath reported on experiments with seeds received from Central Bureau. Cocozelle Molfetta and Cocozelle Tripoli marrows were exceptionally good. Planted on the same day as a good variety of Rice marrow in sandy loam, they had fruits fit for gathering before the Rice marrow had any set. They were of good quality and kept splendidly, some of last year's being still on hand and fit to keep for another three months. The Humerus water melon was very good, and the Turkish Giant sweet melon the very best he had come across during an experience of over fifty years amongst vegetables in various parts of the world. He was convinced that, with proper care in gathering and handling, this variety could be safely shipped to London. The Fordhook tomato was also exceptionally good, and as a late and heavy cropper, a cross between the Fordhook and Volunteer was a very superior variety. Mr. Eagle also reported on a number of seeds received from the Bureau. East Lothian swede turnip, White Tankard swede, Pineapple, Dwarf Champion, and Prince of Naples tomatoes, White Globe onion, and Yellow Stump carrot were all very good. Dart's Imperial wheat, Holstein Prolific oats, Golden Giant Side oats, and Mennonite oats were all good varieties. A number of other seeds had done fairly well, and others had been failures, the latter partly due to the severe seasons experienced of late years.

HAY.—A discussion took place on the best varieties of cereal for hay. Mr. Henley favored King's Early wheat. Mr. Eagle considered a yellow straw wheat makes the best hay, while the Hon. Secretary and Mr. Chibnall considered Cape Oats the best for farmers' use.

HOMERIA COLLINA.—Members wished to obtain specimens of this poisonous weed, so that they might take action to destroy any plants in the district.

Robertstown, November 12.

Present—Messrs. N. Westphalen (chair.), F. Fielder, J. Armstrong, H. Kotz, J. E. Milde, A. Rohde, and S. Carter (Hon. Sec.)

LICENSING STALLIONS.—Members favor the veterinary examination and licensing of all stallions offered for hire.

Bute, November 1.

Present—Messrs. H. Schroeter (chair.), W. H. Sharman, A. Schroeter, R. Commons, E. Ebsary, and A. Sharman (Hon. Sec.).

THRASHING PLANT.—The question of cutting some portion of the wheat crop and thrashing by the steam thrasher came up for consideration, but members were of opinion that the small quantity of wheat being cut would not justify the Thrashing Company bringing their plant into the district.

FIELD TRIALS.—Various matters in connection with the Field Trial Society were dealt with, some of the members expressing dissatisfaction at the way in which the recent trials at Bute were carried out.

Riverton, November 10.

Present—Messrs. W. Hannaford (chair), T. Gravestock, A. J. Davis, A. F. Paschke, and H. A. Hussey (Hon. Sec.).

NOXIOUS WEEDS.—The Hon. Secretary tabled three weeds identified by the General Secretary, viz.:—*Salvia pratense*, *Euphorbia lathyris*, and *Silene* sp., all being escapees from garden cultivation, and spreading considerably in different parts of the colony.

ABORTION IN PIGS.—The Hon. Secretary read paper from Western Australia Department of Agriculture Journal on abortion in pigs, in which the necessity for care and attention to breeding sows was insisted upon. The special danger of shifting pregnant pigs was insisted. Mr. Gravestock mentioned that one of his Berkshire pigs when pregnant used to catch and eat fowls; he never noticed her do this at other times. Mr. Davis had known pigs when very hungry to eat fowls. The question was raised as to whether there was an inherent tendency in pigs—especially Berkshires—to attack and eat poultry, or whether there was any special times when this vice was apparent.

SEED EXPERIMENTS.—Mr. Gravestock tabled Ranjit and Early Californian Purple Straw wheats. The former, grown from Bureau seed, was very green on November 9, but had stood well and made good growth of straw. The other variety, sown same day, was obtained from Mr. D. Leak, of Rapid Bay. It was earlier than Ranjit, bearded, stood well, and was apparently a very good variety.

DAIRYING.—A fair quantity of milk is being supplied to the local creamery, and more orders for cheese than can be met have been received. The opportunities for dairying in this district are not taken advantage of by the farmers. Sorghum and lucern can be grown very successfully where intelligence and common sense is shown.

Norton's Summit, November 10.

Present—Messrs. J. Jennings (chair), J. Hank, H. Horsnell, A. Smith, and W. H. Osborne (Hon. Sec.).

PEACH COMPLAINTS.—Members suggest that the Central Bureau make inquiries as to the general behavior of peach trees during the present season. Have there been any diseases or troubles (other than defoliation by curl-leaf), such as dropping of buds, splitting of bark, and consequent death of branch? The cause assigned should be stated and also whether the curl-leaf disease has caused the fruit to fall. [Will growers of peach give other members the benefit of their observations on the matters referred to.—GEN. SEC.]

Clare, November 9.

Present—Messrs. W. Kelly (chair), J. Christison, J. Treloar, S. Smith, S. Bray, C. J. McCarthy, W. S. Birks, and H. J. Yelland (Hon. Sec.).

FRUIT PROSPECTS.—Some of the fruit trees in this district flowered abundantly, but did not set heavy crops of fruit. Others that set well did not grow after the calyx was cast. This applied especially to the prunes. The Italian prune set well, but the blossoms were scarce. Stone fruits generally failed to set well, but Mr. Treleaven has a good crop of Diamond plums and Mr. Bray has a good crop of Greengages. Mr. McCarthy said that plums grafted upon old stocks are laden this year, whilst the young trees have not borne so abundantly.

OLIVES.—Some members think that olives could be usefully cultivated in this district.

MAGPIES.—Members spoke of the usefulness of our magpies (*Gymnorhina leuconota*), and thought they are not sufficiently protected.

Meningie, November 10.

Present—Messrs. M. Linn (chair), S. F. Robinson, T. W. R. Hiscock, A. J. Myren, W. Robinson, W. Tregilgas, C. J. Shipway, W. G. Wilks, W. J. Botten, and H. B. Hackett (Hon. Sec.).

MANURES.—Mr. Wilks read a short paper on the use of commercial fertilisers. His experience had not been satisfactory. He broadcasted about 6cwts. of super. on six acres of sandy loam and black soil near Meningie. He only cut from this 1 ton of hay to the acre, which was little or no better than the previous crop. His brother at Ashville broadcasted 10cwts. of bonedust on eight acres sandy soil, and only cut 5cwts. of hay per acre, fully 1 ton less than the previous year's crop. It seemed to him to have had an injurious rather than beneficial effect on the land. [Surely it is not reasonable to compare one season's crop with another in this way. It has often occurred, doubtless on Mr. Wilks's farm as well as elsewhere, that a bad crop is followed by a good one. Would Mr. Wilks attribute the result to the improvement of the land or to the difference in the seasons?—GEN. SEC.] Mr. W. Robinson thought better results would have been secured if the seed and manure had been drilled in. Mr. Hiscock instanced a paddock which had shown poorness since being manured with artificial fertilisers. Mr. Shipway had seen a number of experiments carried out with these fertilisers. Where the manure was used the plant was very much stronger than elsewhere: the places where heavy dressings were applied could also be at once seen by the difference in the growth. Mr. Myren had used 1cwt. of Thomas phosphate per acre on black land, and 1cwt. colonial bonedust on sandy soil, but the crop that year was the worst he ever had. Members thought that, owing to the fact that the land in this district varied so much at only short distances apart, it would be very difficult to carry out reliable experiments with fertilisers. The Hon. Secretary said they would have to ascertain what manures to apply to the different soils; perhaps the General Secretary might be able to advise them. [The only way is to carry out experiments side by side for a year or two, some manured and others not. It is useless attempting to compare the growth of a manured crop this year with an unmanured crop of a previous season's growth. To make a fair comparison conditions in regard to soil, cultivation, rainfall, &c., must be identical. Probably super. will give best results on the lighter soils.—GEN. SEC.]

PRODUCTS FROM SMALL HOLDINGS.—The Hon. Secretary read a paper on "Can more Produce be obtained off Small Holdings and what is the Most Profitable Industry for Small Landholders?" He believed that every small holding in the district could be made to produce 25 per cent. to 50 per cent. more income than at present by intense culture and systematic feeding of dairy cows and other stock. There was one man in the district showing the others what could be done. He had forty-eight acres of land divided into a number of small paddocks. He kept seventeen head of large stock, thirteen being milking cows. The cows were timed to come in at different seasons, the average number milked throughout the year being about nine. He feeds them on green stuff at the beginning of the winter, and in summer, as the grass goes off, on lucern and hay. The cows are frequently shifted from one paddock to another. During the twelve months past his receipts for cream have been about £81; from pigs, calves, and sale of eggs, about £15, besides which, of course, a considerable quantity of produce has been consumed by the owner's family. He would like to know of another place in this district where the returns were proportionately as great. The persons managing the farm were, of course, kept pretty busy, and he believed this was the reason others did not follow out a similar system. By cultivation of green crops and proper attention to feeding he was convinced that in this district dairying was the most

profitable industry for the small holder. Messrs. W. Robinson and T. Hiscock did not think green feed could be grown, owing to their small rainfall and absence of water for irrigation.

EXHIBITS.—Mr Myren tabled sample of tares grown on some sandy land. It was about 6ft. long and equal to 4 tons or 5 tons per acre; $\frac{1}{2}$ bush. of seed per acre was sown. He had been told that tares did best on stiff black land, but here they grew well on sandy soils. Mr. Tregilgas tabled samples of Cape barley he had found growing on scrub land; it was about 4ft long and well headed. Members thought that a considerable portion of the desert land would yield one or two good crops, as the rainfall was fairly good.

Bakara, November 2.

Present—Messrs. R Barrow (chair), J. V. Barrow, R. Wilson, A. Hermann, J. Roy, E. A. Hayward, H. R. Hayward, F. C. H. Martens (Hon. Sec.), and three visitors.

RABBIT DESTRUCTION.—Rabbits are exceedingly numerous, and are doing considerable damage to crops throughout the district. Members preferred poisoning with strychnine and phosphorus to bisulphide of carbon in the burrows. Digging out the burrows deeply and filling them in again was also recommended. Members were of opinion that, to effectually destroy the rabbits, simultaneous action throughout the district was necessary.

Arden Vale, November 5.

Present—Messrs. E. H. Warren (chair), M. Eckert, C. Pearce, A. M. Fricker, L. Warren, F. Schutloffel, G. Miller, A. Hannemann (Hon. Sec.), and a large number of visitors

VISIT TO FARMS.—During the day five of the members paid a visit of inspection to a number of farms in the district. The effects of the dry weather and the ravages of locusts and rabbits were apparent every where; in most cases the crops were short thin, and eaten down. At Mr. W. Schumann's a patch of Steinweidel wheat on well-worked fallow promised quite 20bush per acre. At the Old Mount Arden Station, now owned by Hon. R. W. Foster, M.P., twelve different kinds of wheat were being tried, mostly on well-worked fallow; 250 acres had been put in with the seed drill, half the area being treated with mineral super. at the rate of 75lbs. per acre. Purple Straw, Smart's Purple, Bartlett's Crossbred, and Marshall's Early Solid Straw varieties looked well, those drilled with manure promising 13bush. per acre, and those without, 11bush. Bartlett's Crossbred and Marshall's Early Solid Straw were considered very promising varieties. Tuscan, Red Straw, and Steinweidel looked well, but Majestic, Herculean, Silver King, and Marshall's No. 3 are failing, being too late for this district. Mr. Leopold had put in 50 acres with the drill, 30 acres being also manured. The crop was put in late in May on land not fallowed, and promises 7bush. on manured portion and about 6bush. on the other. Considering the circumstances, members thought the result was fairly good. Mr. Leopold considered that the saving of seed alone justified the use of the drill. Mr. Eckert's crop was drilled in late on land not fallowed, and was inferior to part scarified in March. Other crops were also inspected, and at the meeting considerable discussion took place, the majority of members being of opinion that it will not pay to use fertilisers where the rainfall is under 12in. per annum unless the land is exhausted. Fallowing and thorough working of fallow land was recommended. Members hoped that the experiments with the

seed and fertiliser drill would be continued in the district. Mr. Eckert, in reporting on visit of inspection to Mr. A. F. Noll's farm near Quorn, expressed the opinion that the practice of drilling and manuring the crops would pay, even in the North.

ANNUAL MEETING.—This meeting, being the annual harvest meeting, largely partook of the nature of a social, songs, recitations, music, &c., enlivening the proceedings. Members met at the residence of the chairman, there also being present a large number of visitors from all parts of the district.

Balaklava, November 10.

Present—Messrs. W. Smith (chair), W. H. Sires, A. Manley, E. Hains, Jas. MacLachlan, jun., W. Tiller, A. Hillebrand, J. Vivian, W. H. Thompson, and E. M. Sage (Hon. Sec.).

BUNT.—Pamphlet from Mr. W. Farrer, of New South Wales, on experiments for the prevention of bunt, and paper by Mr. C. N. Grenfell, of Mount Templeton, were read. A short discussion took place on best method of pickling, *i.e.*, on the floor or by dipping in a tub or other vessel. Messrs. Tiller and Thompson had both found pickling in a vessel ineffective, but when pickled on the floor their crops were free from bunt. Mr. Smith said that unless fresh pickle were added after every few bags had been dipped the wheat would not be free from bunt. The Hon. Secretary could not see how this could be: the spores of bunt would not live in the pickle if of proper strength. He always put his seed through the winnower before pickling, and did not empty the pickle tub from beginning to end of the seeding, and still his crops, from seed of his own growing, were free from bunt. The Hon. Secretary tabled a plant of Steinwedel wheat with four sound heads and six destroyed by loose or flying smut; also two plants of Neuman wheat—one with two bunted and five sound heads and the other with one bunted and four sound. These were obtained from a neighbor's crop. Members were agreed that if pickling were properly done and care taken not to allow the grain to become reinfected bunt would not be troublesome.

Mount Gambier, November 26.

Present—Messrs J. Watson (chair), M. C. Wilson, J. C. Ruwoldt, W. Mitchell, T. Edwards, J. Dyke, W. Barrows, T. H. Williams, G. Bodey, and E. Lewis (Hon. Sec.).

ANNUAL TOUR.—Members visited a number of farms, &c., in Gambier West, beginning at Moorak, where Mr. Browne showed them through the orchard and garden first. These are watered from the Blue Lake service, and fruits, flowers, and vegetables were extremely luxuriant, also all kinds of forest trees and shrubs. Thence they proceeded to the woolshed, where twenty-five shearers were at work on 26,000 sheep, of which 2,700 were pure Lincolns. The clip from imported sheep was very heavy. A paddock of forty acres of lucern about a mile west looked well, and gave two good crops last season. At Mount Gambier West Cheese Factory the manager (Mr. A. S. Mitchell) is taking in 600galls. of milk daily, of which 400galls. are used for cheese and 200galls. for butter. Water is obtained from a well, but soon will be supplied from the Blue Lake mains. Some forty to fifty pigs are kept on the waste whey, skim milk, &c. Next Mrs. Sassanowsky's farm was visited, where they saw fine crops of Manitoba and Tuscan wheats. The former is much later than the Tuscan. Several good crops of oats, barley, &c. were inspected. The orchard was rather overborne by close proximity to large pines and other trees. About 900 crossbred sheep are kept, and four pure Leicester rams have lately been imported, also

some Shropshires. A good number of grade Ayrshire cows are kept. From here they went on to Mr. W. Barrows' farm, where large fields of grass hay were seen cut and ready for stacking. The crops of hay were very heavy. Several very nice colts and fillies were inspected, the progeny of Royal Ben, Clydesdale Hero, Maori Chief, and Sir James. This farm, like the precedent one, is exceedingly well appointed, and the extensive stables, implement sheds, storehouses, and other buildings are roomy and well built. Each of the numerous paddocks is watered from a well 100ft. deep on the highest point of the farm, water raised by wind-engines into a 2,000gall. tank, and conveyed by pipes to troughs. Sheep and lambs to the number of 1,100 had just been shorn. Only a few cows are now kept. Most of the wheat grown is Tuscan, but several small plots are being tested with Majestic, Silver King, Ranjit, Marshall's Hybrid, and Allora. There is a nice little garden here, with flowers, shrubs, &c. Members experienced the usual hospitality at each and every place visited.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of November, 1900 :—

Adelaide	0.56	Hoyleton	0.69	Macclesfield	1.12
Hawker	0.07	Balaklava	0.22	Meadows	0.97
Cradock	0.15	Port Wakefield	0.46	Strathalbyn	0.74
Wilson	0.32	Saddleworth	0.55	Callington	0.74
Gordon	0.31	Marrabel	0.58	Langhorne's Bridge	0.56
Port Germein	0.21	Riverton	0.56	Millang	0.58
Port Pirie	0.24	Tarlee	0.42	Wallaroo	0.24
Crystal Brook	0.10	Stockport	0.33	Kadina	0.16
Port Broughton	0.68	Hamley Bridge	0.36	Moonta	0.48
Bute	0.28	Kapunda	0.61	Green's Plains	0.16
Hammond	0.14	Freeling	0.47	Maitland	0.57
Bruce	0.18	Stockwell	0.49	Ardrossan	0.99
Wilmington	0.19	Nuriootpa	0.34	Port Victoria	0.82
Melrose	0.21	Angaston	0.34	Curramulka	0.57
Booleroo Centre	0.15	Tanunda	0.63	Minlaton	0.72
Wirrabara	0.03	Lyndoch	0.96	Stansbury	0.83
Appila	0.31	Mallala	0.93	Warooka	1.03
Laura	0.19	Roseworthy	0.82	Yorketown	0.84
Caltowie	0.11	Gawler	0.94	Edithburgh	0.92
Jamestown	0.18	Smithfield	0.81	Fowler's Bay	0.14
Gladstone	0.09	Two Wells	0.83	Streaky Bay	0.41
Georgetown	0.13	Virginia	0.90	Port Elliot	0.42
Narridy	0.26	Salisbury	0.78	Port Lincoln	0.68
Redhill	0.58	Teatree Gully	0.99	Cowell	0.52
Koolunga	0.54	Magill	0.69	Queenscliffe	0.31
Carrieton	0.49	Mitcham	0.79	Port Elliot	0.88
Eurelia	0.08	Crafers	1.08	Goolwa	0.61
Black Rock	0.07	Clarendon	1.24	Meningie	0.75
Orroroo	0.09	Morphett Vale	0.88	Kingston	0.62
Johnburgh	0.35	Noarlunga	0.93	Robe	0.53
Petersburg	0.05	Willunga	0.83	Beachport	0.27
Yongala	0.10	Aldinga	0.27	Bordertown	0.25
Terowie	0.19	Normanville	0.97	Wolsley	0.21
Yarcowie	0.14	Yankalilla	1.10	Frances	0.36
Hallett	0.63	Eudunda	0.36	Naracoorte	0.51
Mount Bryan	—	Truro	0.45	Lucindale	0.61
Burra	0.52	Mount Pleasant	1.18	Penola	0.31
Snowtown	0.65	Blumberg	0.95	Millicent	0.35
Brinkworth	0.58	Gumeracha	1.11	Mount Gambier	0.37
Blyth	0.38	Lobethal	1.02	Wellington	1.08
Clare	0.76	Woodside	1.05	Murray Bridge	0.85
Mintaro Central	0.53	Hahndorf	0.62	Mannum	0.80
Watervale	0.41	Nairne	0.95	Morgan	0.17
Auburn	0.52	Mount Barker	0.81	Overland Corner	0.37
Manoora	0.37	Echunga	0.90	Renmark	0.51

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY

(C. C. CORNISH, SECRETARY).

Labor Bureau.

Number of Persons Registered, and found Employment by Government Departments and Private Employers, from October 29 to November 28, 1900.

Trade or Calling.	Number Registered.		Number found Employment.
	Central Bureau.	Country Agencies.	
Laborers and youth laborers	62	152	285
Carpenters	4	2	4
Bricklayers, masons, stonecutters	1	1	2
Plasterers and improvers	—	—	3
Boilermakers, blacksmiths, and assistants	4	6	11
Plater and patternmaker	—	—	2
Riveter and moulder ..	2	—	2
Fitters and turners	6	4	1
Enginedrivers	2	—	—
Rivet boys	2	—	1
Brassfinisher	1	1	1
Apprentices	11	6	—
Cleaners and glut cleaners	15	1	2
Carriage washers and junior porters	36	16	10
Farm hands	—	—	2
Gardeners	1	—	1
Wattle-strippers	—	—	12
Shepherd	—	—	1
Deck hand	—	—	1
Married couple	—	—	1
Painters and improvers	3	—	—
Baker and cook	4	—	—
Miners	2	5	—
French-polisher	2	—	—
Totals	158	202	342

November 29, 1900.

A. RICHARDSON, Bureau Clerk.

General View of the English Factories Acts.

CONTRIBUTED BY INSPECTOR BANNIGAN.

(Continued from page 418.)

PERIOD OF EMPLOYMENT FOR WOMEN.

A. — Ordinary Period.

In textile factories, 6 a.m. to 6 p.m., or 7 a.m. to 7 p.m., with two hours (of which one hour is before 3 p.m.) for meals.

On Saturday, 6 a.m. to 12.30 p.m. for manufacturing purposes, and to 1 p.m. for other purposes; or (if not less than one hour is allowed for meals) 6 a.m. to 1 p.m. for manufacturing purposes, and to 1.30 p.m. for other purposes; or from 7 a.m. to 1.30 p.m. for manufacturing purposes, and to 2 p.m. for other purposes, with at least half an hour for meals in any case.

In non-textile factories, and in workshops where children or young persons are employed, 6 a.m. to 6 p.m., 7 a.m. to 7 p.m., or 8 a.m. to 8 p.m., with one and a half hours (of which one hour is before 3 p.m.) for meals.

On Saturday, 6 a.m. to 2 p.m., 7 a.m. to 3 p.m., or 8 a.m. to 4 p.m., with half an hour for meals.

In a non-textile factory or a workshop Saturday employment may be from 6 a.m. to 4 p.m., with two hours for meals, for a woman who has not been employed for more than eight hours for any day in the week, if notice of non-employment has been affixed in the workshop or factory, and served on the inspector.

In workshops conducted on the principle of not employing children or young persons, a specified period of twelve hours, between 6 a.m. and 10 p.m., with a specified period of one and a half hours for meals.

On Saturday, a specified period of eight hours, between 6 a.m. and 4 p.m., with a specified period of half an hour for meals.

In domestic workshops there are no restrictions on the employment of women.

B.—Alteration of Hours.

In any non-textile factories and workshops which may be specified in an order by the Secretary of State, the period for women may be from 9 a.m. to 9 p.m.

In the process of Turkey red dyeing, may be till 4:30 p.m., if the additional hours have already been deducted on some day or days in the same week.

C.—Overtime.

The principal case in which overtime employment of women is allowed is that of specified non-textile factories, workshops, and warehouses (the list of which the Secretary of State has power to extend) in which either materials are liable to be spoiled by the weather, or there is a press of work at certain seasons, or there may be a sudden press of orders from unforeseen causes. In these places women may be employed either from 6 a.m. to 8 p.m., or from 7 a.m. to 9 p.m., or from 8 a.m. to 10 p.m., with two hours (of which half an hour must be after 5 p.m.) for meals. A woman may not be employed overtime under this exceptional provision on more than three days in a week, or on more than thirty days in a year.

In certain specified non-textile factories and workshops (the list of which the Secretary of State has power to extend) a woman may be employed at the end of a day's work for an extra half hour, in order to complete an incomplete process, but on condition that any such extra half hours must be deducted from the total period for the week.

Where there is danger of damage from spontaneous combustion in Turkey red dyeing, or from any extraordinary atmospheric influence in open-air bleaching, a woman may be employed overtime to prevent the damage.

In certain specified non-textile factories and workshops, in which the articles or materials dealt with are of a perishable nature, women may be employed from 6 a.m. to 8 p.m., or from 7 a.m. to 9 p.m., with two hours (of which half an hour must be after 5 p.m.) for meals. A woman may not be employed overtime under this exceptional provision on more than five days in a week, or on more than sixty days in a year.

In factories driven by water power, and liable to be stopped by drought or flood, the Secretary of State may authorise the employment of women from 6 a.m. to 7 p.m., with intervals for meal hours, on days other than Saturdays. This overtime must not be worked where the danger is from drought more than ninety-six days, or where the danger is from flood on more than forty-eight days in any year. It must not extend beyond the time already lost during the previous twelve months.

PERIOD OF EMPLOYMENT FOR CHILDREN.

*A.—Ordinary Period.***In textile factories—**

Employment must be either in morning or afternoon sets or on the alternate-day system.

Morning and afternoon sets—

The morning set begins at the time when employment of young persons begins in the factory, *i.e.*, at 6 a.m. or 7 a.m.

The morning set may end either at 1 p.m. or at the beginning of the dinner hour (if before 1 p.m.), and the afternoon set may begin either at 1 p.m. or at the end of the dinner hour (if after 1 p.m.).

If the dinner hour does not begin before 2 p.m. the afternoon set may begin at noon, in which case the morning set must end at noon.

The afternoon set ends at the time when employment of young persons ends in the factory, *i.e.*, that is at 6 p.m. or 7 p.m.

On Saturday the period for children begins and ends at the same time as the period for young persons. But a child may not be employed on two successive Saturdays, nor any Saturday if his period on any day in the same week has exceeded five and a half hours.

A child may not be employed in a morning set on two successive periods of seven days nor in any afternoon set in two successive periods of seven days.

Alternate day system—

The period for children is the same as for young persons. Under this system a child may not be employed on two successive days, nor on the same day in two successive weeks.

In non-textile factories and workshops—

Employment must be either in morning or afternoon sets, or on the alternate day system.

Morning and afternoon sets—

The morning set begins at 6 a.m. or 7 a.m. or, if the period for young persons in the factory or workshop is from 8 a.m. to 8 p.m., it may begin at 8 a.m.

The morning set may end either at 1 p.m. or at the beginning of the dinner hour (if before 1 p.m.), and the afternoon set may begin either at 1 p.m., or at the end of the dinner hour (if after 12:30 p.m.).

If the dinner hour does not begin before 2 p.m. the afternoon set may begin at noon, in which case the morning set may end at noon.

The afternoon set ends at 6 p.m. or 7 p.m. (according as the morning set began at 6 a.m. or 7 a.m.), or if the period for young persons and women in the factory or workshop is from 8 a.m. to 8 p.m., it may end at 8 p.m.

On Saturday the period for a morning or an afternoon set is the same as on other days, except that the afternoon set must end at 2 p.m., or at 4 p.m. if the period for young persons and women is from 8 a.m., to 8 p.m. A child may not be employed on Saturday in the same set as on any other day of the same week.

A child may not be employed in a morning set in two successive periods of seven days, nor in an afternoon set in two successive periods of seven days.

Alternate day system—

The period is from 6 a.m. to 6 p.m. or 7 a.m. to 7 p.m., or (if the period for young persons and women is from 8 a.m. to 8 p.m.) from 8 a.m. to 8 p.m., with two hours for meals.

On Saturday from 6 a.m. or 7 a.m. to 2 p.m. or (if the period for young persons and women is from 8 a.m. to 8 p.m.) from 8 a.m. to 4 p.m., with half an hour for meals.

Under this system a child may not be employed on two successive days, nor on the same day in two successive weeks.

In domestic workshops:—

Employment is only in morning and afternoon sets, and not on the alternate day system.

The period is from 6 a.m. to 1 p.m., or from 1 p.m. to 8 p.m., or on Saturday afternoon from 1 p.m. to 4 p.m.

A child may not be employed before 1 p.m. in two successive periods of seven days, nor after 1 p.m. in two successive periods of seven days.

On Saturday a child may not be employed before 1 p.m. if he has been employed before 1 p.m. on any other day in the same week, nor after 1 p.m. if he has been employed after 1 p.m. on any other day in the same week.

There must be no continuous employment for more than five hours without an interval for half an hour for meals.

B.—Alteration of Hours.

In certain non-textile factories and workshops specified in an order by the Secretary of State, if the period for young persons and women is from 9 a.m. to 9 p.m., the morning set for children begins at 9 a.m., and the afternoon set ends at 8 p.m.

C.—Overtime.

In certain specified non-textile factories and workshops (the list of which the Secretary of State has power to extend) a child may be employed at the end of a day's work for an extra half hour, in order to complete an incomplete process, but on condition that any such extra half-hour must be deducted from the total period for the week.



Journal of Agriculture

AND

Industry.

No. 6. REGISTERED AS

JANUARY, 1901.

[A NEWSPAPER. VOL. IV.]

NOTES AND COMMENTS.

Considerable difference of opinion exists amongst horseowners as to the relative values of whole and crushed oats for feeding purposes. This is a sufficiently important matter to be dealt with at the meetings of the Agricultural Bureau, and the opinions of practical farmers would be of great value. Another question which might well be considered is the comparative values of bran and oats for working horses. To all owners of working horses the question of the best, and at same time cheapest, ration is one of great importance.

If a horse is fed and then watered within half an hour the best part of the food will be carried away from the stomach into the intestines, and therefore it is much better to give water either half an hour before or two or three hours after feeding. This is the advice that is going the round of the agricultural papers, but it is worthy of discussion amongst those who are well acquainted with the digestive economy of horses.

Kangaroo Island appears to be the very best adapted for breeding Angora goats. They will eat nearly every plant that grows there in such abundance; they need scarcely any water; they do well on the roughest of country; their wool (or hair) is of greater value than that of sheep; the skins of young Angoras are in great demand. The purer the goats the greater the profits.

Pure cider vinegar is by far the best for every purpose for which vinegar is required. The word "vinegar" is a corruption of the French "vin aigre" or sour wine; so, as a matter of fact, anything purporting to be vinegar if made from anything except wine is not vinegar. Probably there is a very small proportion of true vinegar amongst the great bulk put upon the market. When made from apples, malt, honey, sugar, the so-called "vinegars" are pure, nice, and wholesome; but there is quite a large quantity of spurious vinegar made from pyroligneous acid and other chemicals which are not pure, nice, or wholesome. It is a pity that we have no law and administration of such law to prevent the sale of such unwholesome rubbish as that last alluded to.

The late Mr. Bradke, near Jamestown, was once subjected to criticism because he had his grape vines trellised to grow 8ft. above the ground, but he had an answer which settled all doubt as to the correctness of his practice. When he grew vines in the ordinary way, near the surface, the frost cut them off every year, and he got no grapes. When all the growth was confined to a space above 8ft. from the soil the growth was never injured by frost, and he secured fruit. Similar treatment in other localities where night frosts occur rather late in spring would probably give equally satisfactory results.

A number of experiments have been conducted in Canada to test the effect of spraying whitening on fruit trees to delay the starting of growth till frosts are over. In many cases the sprayed trees were nine to twelve days later in starting growth.

The Melbourne *Leader* mentions that, in Sydney, some potatoes in cases imported from Germany sold at £8 per ton, whilst on the same day potatoes from Ballarat brought only £6 per ton, and Derwent (Tasmania) potatoes sold at £5 per ton. New Sydney potatoes sold at £6 to £7 per ton. There may have been something in the prime quality of the properly mature condition of the German potatoes as compared with the immature condition of the local new tubers, or the over mature character of the old ones, but there is a deal of significance in the fact that the potatoes were packed in cases, and that they arrived in the pink of perfection after a voyage of 10,000 miles is good proof of the advantage of packing them in cases or baskets in preference to "shoving" them in bags and treating them as though they were cobble stones.

The *California Fruit Grower* of October 27th, 1900, states that in Germany any person can register a trade mark that has not been registered previously in Germany. As a consequence certain "smart" (not to say "honest") persons have registered the trade marks of several prominent American manufacturers, who thereupon are compelled either to purchase from the "smarties" the right to use their own trade marks in Germany or to relinquish trade with that country. Bicycles and special brands of preserved fruit are mentioned in this connection.

In the report of the Pyap Agricultural Bureau, in last month's issue, Mr. S. McIntosh, Village Settlement Expert, is reported to have said that fruitgrowers on the Murray, and as far south as Adelaide, will only be troubled with peach aphid and curl-leaf during a wet season. Mr. McIntosh writes the Editor that he was incorrectly reported in this matter. What he said was that, from what he had seen, he felt sure that on the sandy lands of the Murray Valley neither peach curl-leaf nor aphid were to be feared, except during a wet season.

It is strange that the Queensland pineapple growers have not struck on the idea of expressing and condensing the juice of that delicious fruit for use in the southern colonies during summer and autumn, just as limefruit juice is treated. Not only would such an article be greatly appreciated as an agreeable light acid

drink when mixed with water, but as a remedial agent in cases of bronchitis, asthma, diphtheria, and other affections of the breathing organs, besides being a constant and powerful digestant of albuminous matter. Surely, in view of all these claims, we ought to have Queensland pineapple juice constantly on draught.

There will probably be a glut of some varieties of fruits this season, and it is desirable that these should be utilised. An easy way to deal with large quantities would be to evaporate them. Small but up-to-date evaporators are made by Messrs. A. Simpson & Sons, Adelaide, which are capable of curing several bushels per day. Such fruit should if possible be taken at once from the evaporator into a moth-proof room, well ventilated by wire gauze, and, when properly "sweated," packed in boxes if for marketing. Moths will thereby be excluded, and the fruit will be free from the caterpillars or "grubs."

Condensed apricot pulp is prepared and exported largely every year at Los Gatos, California, for use in Europe. The fruit is actually pulped, and the moisture evaporated to such an extent that no fermentation can take place, and it is then put up in gallon and 5gall. tins for use in jam and jelly making. No sugar or preservative of any kind is required with fruit pulp when the moisture is evaporated to such an extent that the pulp will not flow when the vessel containing it is laid on its side—that is, when the pulp has the consistency of cold newly-made glue.

The New South Wales Government has revised its system of subsidising agricultural societies. No subsidy is to be granted to any society having less than fifty members or receiving less than £50 annually from members' subscriptions. In no case will the total subsidy exceed 15s. in the pound on members' subscriptions, and will not be granted on prizes offered at shows held more frequently than once a year. The subsidy then can only be devoted to supplement prizes for live stock, farm produce, dairy produce, horticulture, farm and dairy implements and appliances. No established society will be entitled to a subsidy if situated within thirty miles of another society, unless the sum given for approved prizes amounts to at least £100; and no society established hereafter within thirty miles of an existing society will be entitled to receive any subsidy. The total subsidy to any society is not to exceed £1,000 in one year.

It is quite a frequent occurrence that a common cow, of no particular breed, will prove to be a heavy milker and a good butter producer; but she cannot be depended upon to breed heifers of any good account, especially if the sire is not descended from a good dairy family. On the other hand, the progeny of a cow descended from a family of heavy and rich milkers will seldom or never prove to be much inferior to the mother, especially if the sire is also descended from a good dairy family.

THOSE UNFORTUNATE WOULD-BE WHEAT-GROWERS.

Mr. R. G. S. Payne, Hon. Secretary of the Wilmington Branch of the Agricultural Bureau, informs the General Secretary that active steps are being taken to obtain gifts from the more fortunate farmers in Wilmington district of quantities of seed wheat to enable those less fortunate to put their land under crop during the ensuing season. A good quantity has already been given to the committee, and it is hoped that not less than 100 bags, or 400 bush., will be donated at Wilmington alone, and it is confidently trusted that other Branches will show their sympathy with their unfortunate agricultural brethren in an equally practical manner. In order to save carriage, it is suggested that Branches nearest to each centre of failure of crops should form committees to collect and then to distribute seed wheat to those farmers who cannot sow their land without such assistance. Each Branch could do something in this way. In places distant from the centres of failure any donations in kind could be sold locally and the proceeds forwarded to the Hon. Secretary of any Branch nearest to where assistance is required, and the cash could be used for purchase of seed in the neighborhood of the spot where it is needed. Subscription lists have also been placed at the stores and hotels in Wilmington district, and any money so raised will be used in purchase of seed wheat. The General Secretary requests Branches of the Bureau and others to do all that is possible to assist in this matter.

HOUSEHOLD HINTS.

CANNED OR BOTTLED PLUMS.—The plums must be ripe, but not dead ripe, else they will go to mush. Remove the stems and select plums as nearly as possible of one size. Place them in an enamelled preserving pan; half fill it with plums and pour on just enough water to cover the fruit $\frac{1}{2}$ in. Place over a light fire and raise the temperature of the water to anywhere between 190° F. and 200° F. Never let it rise to boiling point— 212° F. Maintain the above temperature until the fruit is cooked. Meantime have the cans, jars, or bottles all clean, dry, warm, and ready. The fruit should have been moved gently about during the simmering. Take it out with a wooden spoon or ladle, and slip it into the can, jar, or bottle, shaking the plums down gently, and when full to the shoulder, or top, fill up with the *nearly* boiling syrup till the vessel is quite full, and close up at once either with bungs that have been just taken out of boiling water, or with elastic bands and lids, or otherwise, to perfectly exclude air. Turn the bottles, jars, or cans upside down, and let stand for a time. If air-bubbles can be seen in the vessel, the work must be done over again. No sugar is necessary in the syrup, but may be added if liked. Most people use from $\frac{3}{4}$ lb. to 1 lb. of sugar to 1 qt. of water.

PLUM JELLY.—After the plums have been canned there will be a lot of juice left in the pan. Boil this down to one-third its bulk; add 12 ozs. brewers' crystals to each pint as reduced; boil this quickly, and when a drop of it will fall to the bottom of a glass of water, it is ready for the jelly glasses. Fill the *hot* glasses quickly to the edge, remove any air bubbles with the back of a knife drawn across the surface, and place the jelly on a sideboard for a few days covered with paper to exclude dust. In five days there should be a tough film on the surface, and then the glasses should be covered with paper that has been dipped in milk, or white of egg, to exclude air and dust.

QUINCES.—These can be sliced and dried, or crystallised, or candied, used with other fruits in pickles, or made into jam or jelly. For jelly, boil the peels and cores until they are quite soft, then strain the juice out through a muslin or flannel bag. To each pint of juice add one pint of brewers' crystals. If the jelly is wanted of an apricot tint, boil the juice and sugar very fast, with the lid of the pan off, removing the pan directly the jelly will set. The dark ruby color can be secured by boiling the jelly slowly for half an hour with the lid on, after which it should be removed so that the rate of boiling, which must now be increased, can be carefully watched, and the desired shade obtained. Place a little of the liquid on a cold plate to find when it jellies; it will darken more rapidly after it jells than before. Place in warm glasses quickly whilst hot, remove air bubbles from the surface, and allow the glasses to stand in a cool place protected from dust until a film forms on the surface, in four or five days; then cover with gummed paper.

MELON AND QUINCE JAM.—For each pound of prepared melon allow $\frac{1}{2}$ lb. of quince and $\frac{1}{2}$ lb. of crystal sugar. Prepare the melon by peeling and slicing. Slice the quince, mix the sugar, quince, and melon in a large dish or bowl and let stand, covered with a cloth, all night; then boil for two hours, or until thick enough. For each 10 lbs. of fruit one lemon, sliced and chopped fine, with only the pips removed, will improve the jam, or 2 ozs. of finely-minced preserved ginger to each pound of melon may be added with advantage.

TO CRYSTALLISE PEACHES, &c.—Take the yellow cling, pare and cut them in half to free them from the stone. To 6 lbs. of fruit allow 2 lbs. of sifted sugar for the sprinkling. Make a syrup of $\frac{1}{2}$ lb. of sugar and a little water; when it becomes hot put in the peaches. Let them remain cooking until quite clear, but not to get red. Take them carefully out, spread them on a broad dish, and set them in the sun to dry. A light mosquito netting will keep off the insects. Strew some of the fine sugar over them, not too much at a time, as it would draw out the syrup too fast. If syrup does not form you must remove the peaches to a dry dish. When they begin to look dry stew some more, and when they have become quite dry place them in jars, with a layer of sugar between two layers of fruit.

RHUBARB JELLY.—To make rhubarb jelly, wipe the stalks and cut them in 1 in. lengths. Do not peel them. Weigh them. Put them into a porcelain kettle, and to every pound of rhubarb add a gill of water. Stew the stalks until they are thoroughly cooked. Then strain the juice that covers them through a thick cloth. Measure it, and to every pint of juice add 1 lb. of sugar. Put the sugar and juice in a porcelain kettle, and let them boil for twenty minutes, or until a jelly is formed. Put away in tumblers or bowls like any other jelly. It will be much richer in flavor and color if the stalks are not peeled.

TO BOTTLE OR CAN ANY KIND OF FRUIT.—Peaches, pears, plums, cherries, apricots, &c. — To each quart of water allow $\frac{1}{2}$ lb. to 1 lb. sugar; put the water and sugar on to boil for ten minutes: have the fruit ready to drop in the syrup, and allow it to boil until soft enough to run a broom-straw or skewer through. Have Mason's or the "Lightning" jars ready (perfectly clean), and lift your fruit with a spoon carefully into the bottles—say, two-thirds of fruit—and fill to the brim with syrup. Screw the tops on at once.

HOME-MADE CRYSTALLISED FRUIT.—The imported crystallised fruit is very costly, and possibly the colors used to make it so attractive are not altogether conducive to robust health. The home-made article is quite as nice, if not so pretty, and costs next to nothing. Dissolve as much pure white sugar in hot water as it will take up. Put this in a large enamelled pan, and drop into it halved peaches, apricots, quartered pears, whole loquats, cherries, or other

fruits, but removing the seeds or stones. Bring the whole slowly to a boil. Let stand till next day, draw off the syrup; add more sugar whilst it is boiling, if it will dissolve it, and pour boiling hot over the fruit. Leave for ten days, then drain the fruit; expose it to a temperature of 200° F. for a hour, and then sift pulverised sugar over it. When cold, expose again to heat sufficient to melt the sugar, and then cool it and pack it in glass jars or otherwise.

NOTES ON VEGETABLE-GROWING FOR JANUARY.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The sudden changes in the weather so frequently experienced this summer have certainly retarded the growth of all vegetables that love heat; at the same time some compensation has been experienced in the ease with which transplanting could be accomplished. All through the hilly districts the sprinklers can be seen distributing showers to all kinds of crops which are grown upon the plains in winter and spring. This method of watering seems to be almost universal in our ranges where a fall can be found sufficient to work them. The gardeners tell me they are more economical in the use of water than the old soakage system of surface channels. In the deep porous soils of the gullies an endless supply of water was required to irrigate a small area by the old method. One patch received too much at the expense of another; now it can be equally and quickly distributed.

In these gully gardens one can see pretty well all kinds of summer vegetables growing along with the crops raised elsewhere in winter. This is a phenomenon seldom noted, and is another instance of the versatility of our climate for the production of useful plants.

On the plains sowings will be made of dwarf and runner beans in the usual way for the production of successional crops. Growing crops of these should be regularly watered. A sprinkling of superphosphate dusted along between the rows and hoed in prior to watering assists to prolong the productive period. All pods should be gathered before the seeds therein swell to anything like full size.

Melons require attention in watering, pinching out growing points to induce branching, and thus secure a larger number of fruits. The runners also should be spread around evenly to give each room. A clod placed on each runner is a ready way to keep it in its proper place. Where possible mulch the surface over which melons, marrows, &c., will run, and thus keep the ground cool and moist.

Tomatoes require securing out of the mud of irrigation channels, and stakes of various kinds are devised. Anything which will keep the plants from lying on the soil, but will not raise them very high above it, will be conducive to the best ripening of the fruits. When the plants have set a good quantity of fruits they should receive a good dressing of superphosphate and plenty of water.

Carrots and parsnips can be planted on deep, loose soils where water is available for irrigating. If the seeds are untried, sow thickly. Sowings of lettuce, radish, and cress may be made in cool spots only at this period. Onions will be harvested. These should be raised carefully and allowed to wilt for a few days in the shade of a tree or shed to permit of the escape of excessive moisture. They should then be laid thinly on shelves in a cool, well-ventilated shed. If bagged, there is danger of the few decaying first infecting the remainder. They are more readily sorted on shelves. Seed

beds will now require preparation. In a sheltered, cool position a shallow pit-frame should be constructed. If the soil is good and deep, take out about 3in. or 4in. of the surface and enrich the remainder with a little well-decayed manure. If the soil is poor, take out about a foot of it and replace it with well-prepared, free compost, made of sand, well-rotted manure, garden loam, old rotted soil from the wood-heap, or any decayed leaves or vegetable matter. The surface of the seedbed should be made perfectly level, to prevent water flowing to one point. The reason for sinking it below the ground-line is to obtain coolness and avoid dry winds. The simplest method of construction is to drive a peg in at each corner and nail palings or boards from 9in. to 12in. wide to them. Such a pit-wall may not be sloping for use at this period, as the sun is overhead and the light direct. A skeleton framework, on which strong calico is stretched, will do better than glass at this season, and a lattice admitting quarter light is also useful. In such a frame as the above make sowings of cabbage, onion, cauliflower, and celery. Sow thinly, or thin out the plants when they come up, as each must be grown sturdily, and the cabbage section should be lifted with a ball of earth upon the roots if possible. Cover the seeds with finely-broken manure, and water with a sprinkler or finely-rosed pot. After the plants are up remove the covers at night, if there be no danger from small animals. Rhubarb requires plenty of water upon the plains just now, and asparagus tops that are yellowing off should be removed. Keep the soil between growing crops loose and all unused ground broken.

ORCHARD NOTES FOR JANUARY.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The season still continues favorable to the orchard, and at no Christmas for many years have the trees shown such a wealth of healthy foliage. In the matter of quantity and quality the fruit harvest has progressed favorably as far as early ripening kinds of fruits have been concerned; but prices, particularly for cherries, have been low. It is seldom that the whole of our cherry-growing country can boast of a crop such as the trees have produced this year. This, doubtless, accounts for the low prices obtainable. In no part of Australia are cherries produced more abundantly or of better quality than in our Mount Lofty Ranges, and it would seem impossible to find a locality more favorable to the growth of this somewhat fastidious tree.

With the freer interchange which must result from federation, it is to be hoped an outlet may be established intercolonially for this fruit. The trade with West Australia has assumed comparatively large proportions, and the method of packing in punnets made to fit in standard crates is yielding great satisfaction in the preservation of the fruits.

This month is an anxious one with the grower of soft stone fruits. Early plums—not well suited to drying—apricots, and early soft-skinned peaches, come crowding in and must be handled immediately.

I look forward confidently to the time when all intercolonial and long-distance trade in peaches will be done by means of the punnet, crate, and wood wool packing. Customers will then realise the best flavor of the fruit. Early pears and apples will be gathered during the month. It is as well to warn growers of the liability to fines of all those persons who remove in any way fruits infested with codlin moth caterpillars from their orchards. Jargonelle pears should be examined very carefully, as the closed-in calyx lobes often conceal the entrance tunnel of the pest. Usually, however, a yellowing spot indicates its whereabouts.

Cultivation is now restricted to breaking and stirring the ground after

irrigation or rain showers, should we be fortunate to receive them. The bending boughs of heavily-laden trees make cultivation somewhat risky in orchards of mature growth.

When it is necessary to support the limb of trees owing to the weight of fruit, props are often used. Some growers make long hooks of stout fencing wire and hook the more pendulous boughs to stouter ones opposite to them. This is a commendable method where practicable, as it permits the limbs to sway and yield to the strong wind without presenting direct obstruction. Props form a fixed barrier, and unless judiciously placed, often cause the outer ends of the branches to break or split down. The props are in the way of cultivating implements, insects take refuge in in them—codlin moth larvæ more particularly—and they are cumbersome to handle. There is no doubt these aids to the tree could have been largely dispensed with if a better system of pruning had been adapted in the early years of its growth.

The first growth of most citrus trees having now hardened, young trees could be transplanted if the roots can be obtained in undisturbed natural condition. A little shading over the newly-planted tree and plenty of moisture at its roots will aid considerably in establishing it. Although I do not usually advocate over-surface mulching, an inch or two of litter spread over the root system will also aid the young tree. If young sappy shoots are upon the trees when lifted, pinch them away, as they will only wilt off, be the transplanting done never so carefully.

Budding will be in full swing now. All kinds of trees will be budded with a view to obtaining growth *next* season. The buds are inserted in the well-known way. The great essential is a free flow of sap in the stock plant. In cutting the buds do *not be afraid to leave a little cellular wood in the bud shield*, but do not put in a shield holding much fibrous tissue. The wood left in should be practically transparent. Insert the shield before the moisture dries off its under surface. Be careful to tie the budded section securely on each side of the bud itself. *Do not* cut away the growth of stock above the inserted bud at once. In a week, if the stocks are very vigorous, or ten days under ordinary conditions, loosen the ties. If the buds have united, allow the ties to remain a little looser than previously. If the buds have failed, insert others immediately, and thus lose no time. Some of the top growth of the stock plant may be removed, but unless it in the way it is best to leave it entirely uncut until winter. In the case of old trees of plum, peach, or apricot, buds can be inserted into limbs as thick as a man's wrist. In renovating grown trees like this it is best to insert the buds into the arms where they emerge from the trunk.

Old trees that have been grafted last spring require attention. If the trees have been very vigorous prior to being cut off, a vent must be allowed for the sap, or in the cases of plums and pears an immense crop of suckers may result. We are often advised to remove all water shoots arising from the stump below the grafts. This I do not believe is always wise. A fair number of these left during the first year—but regulated to avoid injury to the growing scions—helps the tree to maintain an equilibrium and averts sucker growth.

The summer pruning of pip fruits on the plains will be in hand. I refer to the fracturing of strong laterals to induce spur growth. When the growth has just ceased—indicated by the absence of brittle points on the shoots—these laterals are broken half off and allowed to hang down. From one to three buds should be allowed to remain on the stub. These buds will swell up considerably, but not grow into definite shoots if the operation is successful. If the foliage of the peach trees is too dense after the fruits are harvested, a number of the shoots may be removed entirely, *not stumped back*. This admits more light to those remaining, and assists in developing the flower buds lower down on the shoots.

The pinching out of the growing points from strong leading shoots is done on newly planted trees to regulate the growth, and not with a view to induce fruition.

Persons wishing to preserve different kinds of fruits in tins or bottles should secure all of the necessary appliances, as ripe fruits will not wait. I will not go into details respecting the methods to follow, as pamphlets can be procured free from this office dealing with all kinds. A great point in securing a good sample is to have all the fruit of even ripeness. With the apricot one side of the fruit usually ripens before the other; therefore separate those in different vessels, and regulate the cooking and syrup to suit each. There is no reason why home-made preserved fruits should not be as superior as home-made jams, for with a small quantity greater care can be exercised and every detail observed minutely.

The codlin moth will doubtless make an effort to gain headway this season, owing to the abundance of apples and pears. Bandages should be examined with scrupulous regularity at least once each week at this season of the year, otherwise moths will develop and escape. Fallen fruits should be removed and disinfected by means of immersion or boiling. No rubbish should lie about the orchard to harbor the caterpillars. Where practicable sprayings should be continued every fortnight during this month. Growers in localities yet free should avoid careless transmission of empty fruit cases and bags that have been in contact with fruit. This pest doubtless will gradually spread to every district, but the longer its presence can be avoided the better.

Scale insects are now freely hatching, and should be checked by sprayings with kerosine emulsion or resin wash. Curculio beetles are doing a lot of harm this year. Poultry penned beneath the trees are a good check upon them. Paris green mixed with flour, 1oz. to 3lbs. or 4lbs. flour, and dusted over and beneath the dewy foliage, is said to have proved very effective in poisoning them. Bandages tied loosely around the tree stems, with the fold upwards, and examined each morning, will also trap large numbers.

Fungus diseases are showing in some localities, and in late apple districts a spraying with summer-strength Bordeaux mixture would be useful even now in checkmating the spore development.

THE CALIFORNIAN FRUIT INDUSTRY.

Comparatively few Australians have any conception of the magnitude of the fruit-growing industry of California, nor of the extent to which the interests of that country are bound up in the returns from its fruit trees and vines. The *California Fruitgrower* publishes each year a *résumé* of the season's operations, and their harvest number for 1899-1900 contains many interesting particulars, from which the following items are gleaned.

Of fresh fruits, not including citrus fruits, 193,900,000lbs. were exported. Most of this went to New York, Chicago, Boston, and other large cities in America, but very considerable quantities go to Great Britain, the shipments increasing each year, and consisting principally of pears and plums, also apples. Of the whole exports, more than one-fourth, viz., 52,500,000lbs., consisted of peaches, and nearly one-fifth was pears.

Of oranges and lemons 6,624,000 cases were exported, and the season just started is expected to total fully one-fifth more. It is estimated that the railway freight alone amounted to over £1,200,000, and the laborers and supply men took £500,000 to handle the output. That there is ample room in America for this enormous output is evidenced by the imports of foreign oranges and lemons, which last year were valued at £880,000.

Walnuts and almonds reach the respectable total of 15,800,000lbs., of which all but one-seventh is exported. Walnuts yielded 11,160,000lbs., and almonds 4,640,000lbs. As with us, the almond-growers of California find the crop very uncertain. Owing to its early blossoming habit, and the liability to be nipped by frost, as well as to the fact that the bees and other insects which aid cross-fertilisation are not so active, the trees frequently fail to fruit satisfactorily. The last year's crop was considered satisfactory, being six times as much as that of 1898. The imports of foreign nuts into the United States were last year valued at £595,000.

Cured or dried fruits bulk very largely. Not including prunes and raisins the output was 68,500,000lbs. Prunes amounted to 114,227,000lbs., and raisins to 71,568,000. Under the heading of "Cured Fruit," peaches amount to 34,800,000—more than one-half. Apricots are next, but comprise only one-sixth of the total. The present season is not so favorable, peaches being only about three-fifths of that under review, but apricots will be about double. In 1897 the output of apricots was 30,125,000lbs., so that there has been a great falling off during the past three years in the production of this fruit. Dried figs totalled 5,800,000lbs. In Fresno county the "figwasp," or *Blastophaga*, has been successfully introduced, and it is expected that for the season just commenced about 6 tons of cured fruit from the Smyrna figs will be produced. The advance of the Californian prune industry has had a marked effect on the American imports of prunes. From 16,000,000lbs. in 1890 the output of California has increased to 114,227,000lbs., while for the same periods the imports of foreign prunes into the United States has fallen from 34,281,000lbs. to 442,737lbs. The prune crop of Europe and America for 1900 is estimated to exceed that of 1899 by 60,000,000lbs.

The California canned fruit pack reached 3,003,171 cases, of which one-fifth went to Great Britain. Peaches again take first place, being nearly one million cases, apricots being about three-quarters of a million, and pears just over half a million cases. In addition to all this canned fruit, the output of vegetables reached 750,000 cases, principally tomatoes. Of fresh vegetables 68,100,000lbs. were exported during the year; of cured beans, 41,576,900lbs. were sent out of the State.

Of wine and brandy, 23,433,000galls. of the former, and 3,256,513galls. of the latter were produced. According to latest returns 157,000 acres are planted to vines in California, of which 85,000 acres are in wine grapes. The growers received from £3 10s. to £4 10s., on the average, and in some cases up to £5 5s. per ton. For the previous five years wine grapes had averaged under £2 5s. per ton to the growers. The exports of wine amounted to 16,500,000galls.

The olive-growing industry is not altogether satisfactory. The results from quite a number of orchards in Southern California have been and continue to be disappointing. The output of oil amounts to about 100,000galls.

Although honey scarcely comes under the heading of this article it is intimately connected with orchard work. The number of beekeepers in California is about 5,000, who own on an average 150 colonies each. For 1899 the yield was placed at 2,822,000lbs. of comb and extracted honey. The yield has, however, been very light during the past few years owing to lack of rain.

The question of the handling of this enormous yield of fruit products is one of great magnitude, and at times has been of such a character as to result in very unprofitable returns to the growers. Now, however nearly every branch of the industry is managed by a growers' co-operative association. There is an association controlling the sale of the greater part of the cured fruit; there are walnut-growers' district associations through which the products are pooled and marketed. The almond-growers are similarly organised; there is the Californian Raisin-growers' Association, the Californian fruit-

canners' Association. Another association has controlled the wine output, and other branches of the industry have similar organisations for mutual protection. Generally it may be stated that the growers have recognised the necessity for stopping the indiscriminate efforts to sell, of uniting and steadying the markets, and of bringing uniformity and a higher standard into the grading and packing. The various associations ascertain as soon as possible the probable yield of the products they handle, then fix the prices for the various classes and grades, which they practically undertake not to lower during the season, as they are based upon the actual production. The result is that the dealers can purchase at the beginning of the season, feeling safe against any sudden drop in prices. There is, of course, not an actual guarantee of prices in most cases, though some associations are sufficiently strong to do this. The result is satisfactory to all directly interested—to the growers, who get a fair price for their fruit; to the distributors, who are secured against cut-throat competition; and the consumers, who obtain their requirements at fair and regular prices. Contrasting this with the cut-throat competition which exists to the detriment of both grower and consumer where there is no organisation of the character described the benefits of co-operation are evident.

SOUTH AUSTRALIAN WINE AND SPIRITS.

The following items dealing with the production of wine and spirits in South Australia are contained in the annual report for 1889-1900 of the Chief Inspector of Distilleries (Mr. T. N. Stephens):—

Distilleries.

The number of distillers holding licences for the distillation of spirits for sale has not increased since last year, and one wine manufacturer has closed down his still. The licences in force are as follows:—Distillers, 8; wine manufacturers, 11; and chemists and manufacturers, 23. The latter include—Eucalyptus oil, 14; water, 3; acid and water, 1; acid, 2; glycerine and stearine, 2; and stearine, 1. The value of eucalyptus oil exported increased from £1,131 in 1892 to £2,224 in 1899, showing considerable advancement in the development of this industry. The stills used by the distillers and wine manufacturers are of various kinds, from the simple pot to the elaborate rectifying still. The duty payable on colonial distilled spirits is 9s. 4d. per gallon proof when cleared for home consumption. A fee of 6d. per gallon proof is charged on spirits used for fortifying wine, and a fee of 1s. per gallon proof on spirits used for manufacturing perfumery, hairwash, &c. The spirit used for methylating, vinegar-making, and in the preparation of medicines and spirituous tinctures is delivered free of duty, and is used under provisions of the regulations of 1898. There were 124,671 galls. of spirits distilled during the year 1900, which, added to 152,038 galls. on hand on July, 1899, gives a total of 276,709 galls. Of this quantity, 6,644 galls. were written off from the distillery books under the heading "Loss by evaporation, leakage, &c.," and 112,136 galls. were cleared for various purposes during the year, thus leaving a balance of stock of spirits of all kinds on hand July last amounting to 157,929 galls.

The total amount of duty collected on spirits was £13,037 6s. 3d., showing an increase on the previous year's collections of £1,328 12s. 4d. There has been an increase of 2,957 galls. in the quantity of spirits cleared for home consumption, and a slight falling off in the quantity cleared for fortifying wine. The clearances for manufactures were practically the same as in the previous year. The total quantity of South Australian distilled spirits, in proof gallons, cleared free of duty for methylating, vinegar-making, manufacture of medicines

and tinctures, and for export, was 33,778galls., or 3,146galls. more than in the previous year. A slight increase is observable under the heading "Methylated" and a large increase (7,136galls.) for vinegar-making. For medicines and tinctures the quantity was practically the same as last year, but exports have fallen off by about 4,000galls.

The total quantity of South Australian spirits exported was 3,573galls., of the value of £1,020. Of this 1,393galls., valued at £445, went to New Zealand.

It will be interesting to note that of the total quantity of spirits cleared for home consumption, viz., 25,035galls., brandy was represented by 10,094galls., as against 9,404galls. last year, clearly showing, not only that its standard of excellence is being maintained, and that it is competing in the colony favorably with the imported article, which, as a matter of fact, in many instances it undoubtedly excels, but also that this appreciation of the locally-made brandy extends beyond our own shores. This is shown by the fact that of the 3,573galls. of colonial spirits exported South Australian brandy was represented by 3,328galls., of the value of £977.

All the brandy distilled under the supervision of the Excise Department is made from the juice of the grape, and is undoubtedly of a superior character. Some brandies, however, are produced in free stores without such supervision, by compounding duty-paid plain spirit with flavoring essences, coloring, and sweetening matter, &c. The original spirit, the base of these latter transactions, is the product of the distillation of wine, grain, and potatoes (from the latter only to a very small extent, and in one district).

The difficulty met with on the introduction of locally-distilled brandy as against some cheap imported so-called brandies, which were well put up under more than doubtful labels, has, owing to the application of the Trade (Merchandise) Marks Act, been to a great extent removed. This Act is invaluable to manufacturers of good wholesome articles, whether spirits or other goods. Our local makers of pure brandy, for instance, cannot compete with certain foreign so-called brandies put up in good cases with envelopes, bottles, corks, capsules, labels, cartage, and delivery on board ship for 4s. 6d. to 5s. per case of twelve bottles, i.e., 4½d. to 5d. per bottle. This is bad enough in any case, but still worse where the labels are falsely marked, say, "Cognac," with French names of manufacturers. It is this kind of thing that the Act is designed to prevent, and I believe that its application has had a most beneficial effect as regards such spirits.

The estimated consumption per head of population of South Australian liquors during the past year was—Spirits, .07galls.; wine, 2.6galls.; beer, 8.4galls.

The annual imports of spirits have fallen off by about 161,500galls.—from 345,993galls. in 1880 to 184,484galls. in 1899—and wine imports have suffered a reduction of about 36,000galls.—from 51,341galls. in 1880 to 14,946galls. in 1899. This represents a very large loss of revenue. For instance, the proportion of imports cleared for home consumption in 1890 was 13,304galls., yielding £4,731 13s. 6d., whereas in 1899 only 4,684galls. were cleared, the revenue being £3,127 4s. 8d. The duty in 1890 was 6s. and 10s. on still and sparkling wines respectively, and in 1899 the rates were 12s. and 15s. per gallon.

South Australian wine exported has increased by about 466,000galls.—from 29,800galls. in 1880 to 496,510galls. in 1899.

During the year ended June 30th, 1900, colonial spirit was cleared to the extent of 112,136galls. If duty had been charged on this at 9s. 4d. per gallon it would have yielded £52,330 2s. 8d., but as a matter of fact the total revenue derived was only £13,037 6s. 3d., equal to about 2s. 4d. per gallon on the quantity cleared for all purposes, because 852galls. were delivered at 1s. for manufactures; 52,421galls., at 6d. for fortifying wine; and 33,778galls. free, for making methylated spirits, vinegar, &c.

There are eleven wine manufacturers who hold licences to distil spirits for the purpose of fortifying their own wines. The total quantity of spirits distilled by these winemakers during the year, and placed in bond for delivery at 6d. per gallon, as required, was 18,921galls.

Wine-Manufacture.

The total present acreage in South Australia planted with vines is 19,488 acres.

There has been a marked increase in the quantity manufactured during 1900 as compared with the two previous years, but the total is considerably less than in 1896 and 1897.

The quantity of South Australian wine exported during 1899-1900 was 516,923galls. (the quantity for the previous year was 508,376galls.), of the value of £83,316, to the following destinations:—United Kingdom, 428,300galls.; New Zealand, 46,548galls.; West Australia, 17,519galls.; Queensland, 5,548galls.; India, 4,632galls.; New South Wales, 4,295galls.; Tasmania, 2,928galls.; Northern Territory, 2,565galls.; Victoria, 2,241galls.; Ceylon, 1,151galls.; Germany, 722galls.; British Burmah, 186galls.; Straits Settlements, 156galls.; Fiji, 64galls.; Cape Colony, 34galls.; Java, 30galls.; Hongkong, 4galls. The wine labels used in South Australia (as provided under the Distillation Act) are marked "South Australian Wines," without exception.

The importation of vines and vine cuttings is absolutely prohibited, and has been for many years.

As far as the official records show, there is no evidence that phylloxera ever made its appearance in South Australia.

The imports of preservatives of various kinds during the last three years amounted to upwards of 30 tons. That quantity included 22 tons of boracic acid, upwards of 1 ton of salicylic acid, and 7 tons of other kinds not specified.

All the principal winemakers deprecate the use of preservatives in the manufacture of South Australian wines, and the South Australian Vignerons' Association agreed to a clause submitted by me to make illegal the use of preservatives in our wines.

SOME NOTES ON VICTORIAN HORTICULTURE.

BY GEO. QUINN, HORTICULTURAL INSTRUCTOR.

When attending a conference dealing with intercolonial fruit pest legislation in Melbourne recently, by favor of the Agricultural Department of that colony, I had an opportunity of visiting, in company with other delegates, many nurseries and orchards possessing interest to horticulturists generally.

In the suburban area the nurseries cater chiefly for the ornamental plant trade, and the magnitude of their operations in supplying the demand for small decorative plants in pots, such as palms, boronias, ferns, asparagus, &c., at a cheap rate, arouses one's admiration. One feels disposed to think the demand for such plants has been created largely by the efforts of the plant-raisers, who have brought them within the reach of the multitude.

On the eastern side of Port Phillip Bay the fruit-growing district of Somerville is located. Here large supplies of nursery stocks are raised. The country is naturally covered with fairly dense timber of a medium size, beneath which a mixed undergrowth of shrubs, grasses, and herbs is found. The rainfall is good. If memory serves me correctly, it exceeds 30in. annually.

The nurserymen here break up a few acres of scrub land each year, remove any valuable timber, and burn the remainder with the undergrowth. The soil

is then broken up and exposed for a few months and then planted to nursery stocks. The stocks are removed the following winter, and the ground is set out with orchard trees in regular order at approved distances, and the spaces between the trees again planted to nursery stocks for several seasons. By this means the bringing of the permanent trees into bearing is not a costly item. The surface soil is usually free sandy loam, rich in vegetable matter, underlaid by a good retentive clay. In fact, on some of the flats the subsoil appeared to be too retentive. In this district the apples are raised by root-grafting on to blight-proof stocks, and other deciduous trees in the ordinary manner. No citrus stocks were seen. One large grower (Griffiths Bros.) assured me of the successful use by their firm of peach kernels in raising peach stocks, in lieu of setting out the pits unbroken. The young trees here are headed off at a height which gives them a stem from 2ft. upwards in length, and all are securely staked. In the older orchards, if insufficiently sheltered, all of these show a distinct list from the prevailing breezes. Some of the nurserymen use waxed paper instead of cloth in covering the grafted sections. Our old friend the *Australasian* being considered the best help to the horticulturist, is much used in this way, though I am not sure the column usually devoted to enlightening gardeners is the only part that is pressed into this service. The paper is waxed on each side and afterwards cut into strips of a desired width. In a few of the orchards visited the pruning varied from what I am led to believe is good practice. Severing leading shoots midway between the nodes was no uncommon practice, while the dense growth in the centre of most of the trees did not impress me favorably. Peach trees, for instance, are not grown upon a "renewal" principle, but allowed to produce their annual wood at the outer extremities, consequently the production of timber is very great.

Not being familiar with all the prevailing conditions, one hesitates to condemn the practices followed; consequently, I prefer to merely mention them as compared with those found successful here. In planting trees for shelter the Remarkable Pine (*P. insignis*) is largely used, and several magnificent lines of these were seen in the course of our inspection.

In the mountainous district of Gembrook many settlers are establishing fruit gardens. Raspberries are being grown largely, and with a cool climate, abundant rainfall, and good soil, everything points to future success. The fear of over-production appears to have been removed by the establishment in Victoria of an export trade with London in raspberry pulp.

In this district the fine nursery of Mr. A. C. Nobelius is located. This nursery, covering upwards of seventy acres, is without doubt the finest fruit tree nursery I have had the pleasure of seeing in the colonies. One has only to go through the adjoining forest of immense trees and dense undergrowth, out of which this ground has been won, to realise the ind-fatigable zeal of the proprietor of this nursery. Although situated on a fairly steep slope, the whole place is laid out with the regularity of a chess board.

This nursery has been gradually extended year by year as the demand for stock increased. Although at the time of my visit most of the stock was in dormant bud, the trees remaining over from last year were of very high quality. There is about 1ft. of good rich loose soil on the surface overlying a stiff clay. This causes the stock to root freely but not deeply; consequently, when lifted, an abundance of small roots is secured upon the young trees, and very little of the root system left in the soil.

Mr. Nobelius utilises a layering process in the raising of apple tree stocks. Trenches about 2ft. 6in. wide and from 9in. to 12in. deep are opened out, and yearling whipstick trees of Northern Spy are planted three abreast, i.e., three rows in the trench. They are then laid down for covering with soil. Where the tops end the roots of the next are set, and so on until the trenches are filled.

The layers send shoots up from the eyes or buds on the buried stems. These are afterwards taken off. If they are not actually rooted when separated the base of the shoots is in a callused condition, which enables them to form roots very rapidly when planted again in the nursery rows. The removal of these shoots from the primary buds causes their base buds to grow, and so a more abundant crop of shoots is secured the following season. No citrus stocks are grown. Mr. Nobelius says it pays better to import those required to fill orders. This nursery carried on a large trade with Tasmanian planters until that colony imposed prohibitive regulations. Happily the past planting season was unusually extended and an increased demand took up the surplus trees booked formerly for Tasmania. The proprietor informed me his ordinary staff exceeded twenty men and boys, and the nursery boasts a cricket club of no mean merit. A very large bed of rooted cuttings of the Chinese Sand pear was to be used as stocks for ordinary pears. Mr. J. Lang, the well known pomologist, of Harcourt, is one who condemns this stock almost unreservedly, but Mr. Nobelius from a nurseryman's point of view finds it a great aid to the rapid propagation of pear trees. I am not competent to pass judgment upon its merits, but am disposed to lean towards the Harcourt grower's opinion until otherwise convinced. On the hillside occupied by the nursery a very picturesque effect has been obtained by leaving the scattered specimens of the native tree ferns (*Alsophilas*) growing in the positions originally occupied by them when the scrub and messmate giants occupied the slope.

One of the most interesting sights of the place is provided by a plot of about five acres of raspberries. The rows, which are planted about 7ft. apart, are trellised on a three-wire fence similar to that used in our vineyards. The posts are 20ft. apart, and the lowest wire about 2ft. from the soil, the second 18in. higher, and the third a somewhat similar distance above the second. The canes are tied up flatly to the face of the fence so as to form a continuous wall of foliage. Portion of the plantation consists of a thornless variety of Northumberland Fillbasket, which originated on the place. Mr. Nobelius found a thornless cane—a sport upon an ordinary plant—and by selection and propagation raised a stock which remains constant to the character. I have recently introduced a consignment of this variety for a local nurseryman, so it will soon be available for planting. Anyone who has gathered raspberries can understand the value of this thornless plant and of the trellising method herein described. Mr. Nobelius informed me that he manures these every season, using half a ton to the acre, consisting of 8cwts. of superphosphate and 2cwts. chloride of potash (muriate), scattering it between the rows during winter and ploughing it in. The growth of the canes and the quantities of fruit stated to have been gathered made this apparently a profitable transaction.

This fine nursery has been almost inaccessible owing to bad roads. It took our party four hours to travel fourteen miles to reach it from the Narre Warren Railway Station. A narrow-gauge railway now winds its way from Ferntree Gully to within about a mile of the nursery, so that plant lovers will now be able to reach it quickly from Melbourne and enjoy the scenery on the way. I strongly advise any South Australian orchardist visiting Melbourne to take a run up to Gembrook, where the genial and well-informed proprietor will doubtless welcome him and make the visit profitable to all concerned.

At Wangaratta, on the Overland railway to Sydney, a number of orchards have been established. This locality obtained notoriety in past years owing to its being within the sphere of the exploits of the Kelly gang of bushrangers, but it is better known to orchardists of later date owing to the presence of another outlaw which does its dastardly work in a more insidious manner. I refer to the much-dreaded San Jose scale.

The inspectors under the Vegetation Diseases Act of Victoria have been

endeavoring to exterminate this pest, and the results, in some orchards more particularly, appear to have been highly successful. In one, however, we discovered a few insects which had apparently thus far escaped the destroying spray. The remedy used is the well known lime, sulphur, and salt wash. This appears to be a fine agricultural and grazing district, and evidently suits the stone fruits and vines well, but the few apple trees seen did not seem to be thoroughly at home. We were told that large quantities of citrus fruits had been grown, but the heavy soils did not favorably impress one of the possibilities in this direction.

On the railway line to Bendigo, between Castlemaine and the former town, the fruit-growing district of Harcourt is located. At Harcourt station the visitor meets the familiar sight of stacks of returned fruit cases upon the platform. This country is of granitic formation. Its general topographical features and climate remind a South Australian visitor somewhat of the country around Kersbrook. Harcourt is celebrated throughout Victoria for the fine apples and pears produced there. Probably one of the best informed and most successful growers of these fruits at Harcourt is Mr. James Lang, of Langdale. His orchard covers about forty acres all told. The progressive character of the owner is seen in the up-to-date methods of working the place. In the old orchard scarcely a tree remains as it was originally planted. Varieties proved useless or unsuitable to the locality have been regrafted to those which would thrive and prove profitable. In this orchard the Winter Nelis pear, so shy bearing with us, yields fair crops under a system of pruning which removes about three-fourths of the matted spurs every few years. The Josephine de Malines pear forms a fine tree, worked upon Vicar of Winkfield or Uvedale's St Germain stems, which have been allowed to grow for several years to gather strength. Mr. Lang is a leading exporter of apples to London, and studies the matter closely. Our favorite, Cleopatra, reaches a high quality at Langdale, and is used for export. A variety possessing good late-keeping qualities, and known as "Pioneer," is grown. It resembles a Stone pippin, and keeps equally well, at the same time possessing a better flavor for dessert purposes. Mr. Lang has been good enough to forward a parcel of scions to me for trial here. The codlin moth is combated here by sprayings with Paris green and the bandaging process. Mr. Lang says four sprayings keeps his damage down to about 5 per cent. infested fruit, and strongly believes in this method where it can be cheaply and quickly applied. Green manuring is resorted to here. Early in the winter the soil is ploughed roughly and field peas are sown thickly. These are allowed to grow through the winter, and in spring, when in full bloom and foliage they are ploughed under. A roller is put over the pea-covered ground first, and then a plough fitted with a steel disc coulter, and a drag chain turns them in most effectively. At the time of our visit this operation was in progress in a neighboring orchard. The heavy sward of peas reached one's hips, and should add much humus to the soil. I think there is something in this practice worthy of adoption by our orchardists in the lighter soils. The cleanly tactics followed in our orchard cultivating year after year must tend to dissipate the original humus.

TEMPERATURE OF EVAPORATING MACHINES.—Of late years the degree of heat at which evaporators are run has become much higher among the most successful parties in America. It is an almost universal practice now to subject the fresh fruit to a temperature of 240° F. for about thirty minutes, according to the size, and then remove to a finishing room, where a uniform temperature of 135° F. is maintained. The essential point in all evaporators is complete and rapid circulation of air. Unless this be present the fruit will stew instead of dry. Roughly speaking, apricots, peaches, and plums, exposed to a heat of 240° for thirty minutes, will lose 12½ per cent. of the water of the juice.

WHEAT-STEM-KILLING FUNGUS.

Mr. H. Roediger (Hon. Secretary of the Gawler River Agricultural Bureau) recently brought to the Central Bureau office some wheat plants to all appearance quite mature, but the heads, though well formed, were absolutely devoid of grain. On close examination there appeared to be a constriction of one or more joints of the plant, and at the base of the stems there were indications, in the form of sooty spores, of a fungus disease. The samples were sent to Mr. D. McAlpine, Vegetable Pathologist to the Victorian Department of Agriculture, who states that he finds the wheat attacked by the fungus disease known in Europe as the "wheat-stem killer" (*Ophiobolus herpotrichus*). This is the first recorded instance of the disease in Australia, though it has probably existed here for some years. Mr. McAlpine states that in France good results have been obtained by dressing the fields with phosphatic manures, and he thinks it is possible that the use of fertilisers in this particular instance may have prevented the disease becoming general. Ploughing in the stubble or burning it off immediately after harvest before the spores have time to ripen is recommended.

Mr. Roediger states that the disease appears in patches of varying sizes. In the heaviest crops the disease was worst, the light crops scarcely being affected. Fresh-ploughed land and well-worked fallow appear to be equally affected. When reaping where the disease is bad it makes a white dust as where weevils have been at work, and settles on the reaper. In one case Dart's Imperial wheat was quite unaffected, though growing alongside another variety showing the disease. It is quite possible that the ravages of this disease have at times been classed as "takeall."

FARM HINTS FOR JANUARY.

BY THE EDITOR.

Where wheat or hay has been taken off with the string binder try at once to loosen up the surface with the harrows or scarifiers. On a few acres of such land it will be well worth the trouble to sow about 2lbs. each of rape and white mustard seed. The harrows or scarifiers will cover much of the seed, and the first decent rain will cause a nice growth of green feed which will be beneficial to all the farm animals.

Save all the straw possible. If any sorghum or maize is available, or leaves of kale, mangolds, or other succulent green fodder, it will make excellent silage if placed in alternate layers 1ft. thick with chaffed straw. About 1lb. of salt sprinkled on each hundredweight of straw will make it more attractive to the stock. In some localities there is abundance of sacred thistle, or artichoke, or fennel, or other succulent vegetation, which could be profitably utilised with straw for ensilage.

Silos can be topped up at any time when there is vegetation available; and, when once in the pit, there is safety from fire. Sorghums, millets, and maize are each in their best condition when the seeds begin to become hard. Sorghums, holcus, &c., can be cut two or three times, but they are best for food when the seed is ripe.

Land that is shaded by a crop, or by shrubs or trees, becomes richer and richer every season if the vegetation is not removed from the spot. When left bare and exposed to the sun, the accumulation of decayed vegetable matter becomes slowly oxidised, and then the heat carries it off, leaving the soil poor and devoid of humus. It is very probable that the cultivation of an autumn green crop may leave the soil somewhat dry and unfavorable for the growth of

a cereal crop immediately following, should the early heavy rains fail to occur; but even in such a case the soil will remain richer and in better mechanical condition than if left bare. Of course, it is not to be understood that the whole of the fallowed land should be under autumn fodder crops, but a portion could be profitably devoted to such purpose; and, should a fair amount of rain come, such cropped land will yield better crops of wheat or other cereals than if left absolutely under bare fallow.

It is essential to the well-doing of all autumn crops that the surface soil to a depth of 2 in., or perhaps 3 in., shall be kept constantly in a finely broken-up condition—not too deep, because thereby the fibrous roots would be injured. Directly the surface becomes caked the moisture rapidly escapes, but whilst the surface is finely broken the moisture rises only up to the broken soil, close to the fibrous roots. The loose soil lets the heat get away quickly, and at night the cooled soil abstracts moisture from the air.

About 500 lbs. per acre of a mixture of fertilisers containing 8 per cent. of available phosphoric acid, 9 per cent. of potash, and $3\frac{1}{2}$ per cent. of nitrogen will benefit all sorts of sorghums and kails, cabbages, &c. At this time of year the manure should be dissolved in water and applied in trenches about 1 ft. removed from the stems of the plants. Then cover the trenches and keep the surface hoed.

It will never pay to leave any stacks unthatched or otherwise protected against rain. Precautions should also be taken against destruction of stacks by grass fires. Stacks should be well separated.

Fill up vacancies in the rows of kail, beets, mangolds, and root crops by transplanting either from nursery beds or when singling.

In some favored localities, especially where irrigation is possible, it is not too late to sow sorghum, holcus, and maize for late green feed. These should always be sown in drills and kept frequently cultivated. The drills should be 3 ft. apart, and the plants 8 in. to 1 ft. apart. Pumpkins and piemons may also be sown with a good chance of a small crop.

No farmer can afford to dispense with sheep. They are very useful in clearing off weeds, but if introduced from certain places they may also bring on a great variety with them. They supply the house with fresh meat and provide lambs for export, and a clip of wool once a year. If the farm is not overstocked with them, the sheep will prove a more certain source of income than either wheat or hay.

On very many farms, and on many occasions, when the season has been "a bad one," it has been proved that the hens and the cows have brought in more money than the fields devoted to attempts to produce corn and hay. The small sums coming in weekly or monthly from the birds and quadrupeds make a respectable amount by the end of the year, whilst the "big cheque" for wheat and hay is too often represented by a very small sum when cashed.

Some people do not scorn to grow fruit and vegetables for their own use. These products are certainly cleaner and fresher than similar articles purchased from hawkers or storekeepers who have obtained their supplies from gardeners at a long distance from the consumers' homes. In most cases where the farmer neglects to grow fruit and vegetables, the family have either to go without, or to use wilted rubbish that could not be sold at any price within radius of a few miles of the spot where grown.

IN France no stallion may be hired unless duly certified by the proper authority as worthy to reproduce his species. The services of the best stallions are within the reach of all. The large requirements of the French War Department provide a certain and fairly remunerative market for the young stock of only average merit, while horses of better stamp are reserved for the English dealer.

BOTFLY AT LOBETHAL.

The horse botfly (*Gastrophilus equi*) has put in an appearance at Lobethal, Mr. F. W. Drogemuller, of that place, having captured two or three, one of which he sent to the General Secretary of the Agricultural Bureau for identification. Wherever this fly appears it makes even the most quiet old stagers extremely restless and sometimes almost unmanageable. The fly attaches its eggs to the hair of the horse in positions readily reached by the mouth of the animal, and they appear to cause much irritation and discomfort; consequently the horse either licks or bites the part, and the eggs become introduced into the stomach, where they incubate, and maggots or "bots" are produced. When nearly mature the "bots" are loosened from the coats of the stomach and are voided in the excrement, whence they burrow into the soil, become chrysalides, and finally emerge as botflies. It has recently been stated by the authorities of the United States Department of Agriculture that a decoction of the leaves of *Tanacetum vulgare* (tansy tea) will expel the bots from a horse's stomach within twenty-four hours. As tansy is a herb commonly cultivated in gardens for the sake of its flowers, it will be easy to verify the value of this recommendation.

Up till the date of the above recommendation no cure for bots had been discovered. Preventive measures recommended were daily application of kerosine rubbed on parts accessible to horse's mouth by means of a cloth. Well-groomed horses are not so liable to be affected by bots as are those that are constantly neglected in this respect. Authorities are nearly all agreed that "bots" cannot and do not cause the death of a horse by perforating the stomach, or in any other way; but there can be little doubt that the animal is much more comfortable and better off when free from the presence of these intestinal "messmates."

POULTRY NOTES.

By D. F. LAURIE.

The Minorca.

Judging from recent correspondence published in English poultry journals, it seems as if the faddist fancier is doing his best to ruin one of the best laying breeds we possess. I have always pointed out the advantages of pure-bred poultry of the right class as against mongrels. At the same time I have always set my face against the cultivation of purely fancy points to the detriment of utility points. Happily some of the foremost breeders and authorities are determined that these misguided faddists shall not ruin the breed. The present craze is for very large ear-lobes. Many will remember that evidence is strongly in support of the theory that the White-faced Black Spanish sported from the old Red-faced Spanish, as the Minorca was at times called, and there is evidence of selection of ear-lobe development playing a prominent point. The day of the Spanish fowl as a utility bird has gone; specimens of good quality still exist, and there is no doubt that they were crossed with the old Minorcas to give style and size and general improved appearance to the latter. The white in the face was in most cases subsequently bred out. Whatever may be the actual facts concerning the origin of Spanish and Minorcas it is proved beyond doubt that undue development of the ear-lobe endangers soundness of the face, which soon shows white. White in a Minorca's face is as bad a blemish as can be; it shows a cross somewhere. Now, we do not want mongrels; they can be bred

easily. When we buy a Minorca we want to be sure of its undoubted purity as well as being satisfied that the specimen conforms to the standard. I hope the Minorca with a sound red face and with moderate ear-lobes will be bred, for such has been the type for years, and the birds have proved themselves admirable layers. It is a comparatively easy matter to breed good-looking young birds, but a Minorca that goes white in the face the second year is no good and there is a serious fault in the breeding somewhere. We find undue development of comb and ear-lobe, too much length of leg, wrong color, too light feathering, and a host of minor details which one generally produces by the introduction of foreign blood. It is much easier to produce certain fancy points by crossing than by careful selection of pure stock, but it is decidedly wrong that these first results should be palmed off as "pure," before all traces of foreign blood are extinguished, but to bring this about takes time and care. We shall probably soon see this type of Minorca in the colonies. They may be sent out by a "breeder" with a well-known name, and yet he is probably entirely wrong. It is evident that in England the term "medium length of leg," as applied only a year or so ago in the case of the Langshan fowl, is now changed into "long" without any hesitation. This is what we may expect in regard to the Minorcas. By all means improve the quality of our stock; but it is no improvement to Langshans to lengthen their legs, and it is certainly a disfigurement to the handsome Minorca to saddle it with a big ear-lobe and a comb utterly out of proportion, as well as length of leg. Melbourne breeders, and especially judges, have a lot to answer for in respect to Minorcas with long legs. I have seen specimens from this colony that I considered on the leggy side, but which were adjudged too short in the leg in Melbourne. The attempt to get long legs in the Indian Game was promptly nipped in the bud.

Poultry in Orchards.

The practice of running poultry in orchards is becoming more general, and, as a rule, the results are satisfactory. Naturally judgment is required, and there should always be ready means of penning them up so as to keep them from mischief. For this purpose the heavier breeds, such as Dorking, Indian Game, Langshans, Wyandottes, and Orpingtons, as well as ducks of various breeds, may be recommended. Where there is soft fruit the active flying breeds will do damage, and turkeys are a nuisance and do much harm. Ducks—especially the active Indian Runners—feed largely at night, and will clear the gardens of snails, slugs, &c. Poultry are invaluable for clearing off curculio beetles and all noxious insects. Young chickens will clear aphides and similar pests in a very short time. Ducks do very little harm among vines, especially if water is freely provided for them to drink. In the hop gardens in Kent it is a common practice to run large numbers of young chickens, removing them when they scratch too much and running younger ones in their places. In many parts our useful insectivorous native birds have disappeared, and are replaced by the sparrow, which never eats insects while it can get grain or fruit. For the first time this year I noticed that sparrows tackled the green caterpillars, but then they work havoc with soft fruit, seedlings, &c., which is not the case with poultry properly regulated. People with small gardens would find it pay well to purchase small flocks of young chickens to keep down insects. When doing damage they can be penned up for a week or so and used for the table. Enormous numbers of young chickens are eaten in France, and the practice is gaining in England.

For Eggs or Table Fowls.

The Victorian and New South Wales export departments are shipping great quantities of frozen poultry, and the business is profitable. So great is the improvement in breeding that very few birds are rejected as unfit for export.

Poultry on a farm should be of such description that any surplus can be disposed of at the best prices; and for eggs only the fowls should be mated so as to produce a majority of pullets. They should not be bred haphazard, but only from the best layers. The surplus cockerels should be eaten, unless really well bred, when they can be sold at good prices.

When table bird breeding is the case, none should be marketed unless young and in first-class condition. Ill-graded mixed lots—old and young, fat and poor—jumbled together bring but poor returns, and the worst bird rules the price. On the other hand, well-graded lots are eagerly sought after.

Remedies and Treatment.

Sulphur.—A teaspoonful of flour of sulphur in the soft food for twenty fowls may be given once a week during the hot weather, but on no account should it be used during changeable weather, as the birds are liable to catch colds, which may develop into something serious.

Tonic.—A deficiency of iron causes hens to cease laying, and their combs soon have a pale shrivelled appearance. This may be remedied by giving sulphate of iron or, better still, the celebrated Douglas mixture, which is made as follows:—Pour 1 gall. of boiling water on $\frac{1}{2}$ lb. sulphate of iron (green copperas, not bluestone), then add half a fluid ounce of sulphuric acid. This must be made in an unglazed jar. Give a couple of tablespoonfuls to each quart of drinking water, or, diluted in the same proportion, may be used for mixing the soft food, and used two or three times a week. All tonics, &c., are much better given in small doses frequently; they have a better effect than a few strong doses, which are often harmful. Do not use metal water receptacles—earthenware is suitable. A 6in. or 8in. flower pot, with a cork in the drainage hole, does excellently.

Spices.—The use of pepper and spices is to be condemned. If all common necessities are provided poultry will thrive and be profitable.

Colds.—During changeable weather birds in ill-constructed poultry houses often catch colds. The first symptoms are watery eyes, running at the nose—clear liquid—and slight sneezing; if neglected the disease may take a serious form and become roup. As a first measure isolate the bird and give it a teaspoonful of glycerine, to which may be added a drop or two of eucalyptus. Give Douglas mixture in the drinking water, and season the soft food with a little ground ginger. It may be necessary to repeat the glycerine.

Fumigating.—Fumigation or steaming may be resorted to where outbreaks on a large scale of the following diseases occur—colds, roup, diphtheria, gapes, bronchitis. Carbolic acid or eucalyptus oil have proved beneficial, and so also have acetic acid and iodine. Medical men have told me that steaming is the more useful form, and that the moist atmosphere does the business. Personally I am in favor of the vapor form without the admixture of water. To do this take an old spade or piece of sheet iron or an old frying-pan, and heat to a red heat; place on the lower compartment of the fumigator box, and slowly drop any of the above-mentioned drugs on to the hot iron. The vapor given off will ascend to the top compartment where the birds are, and they are thus compelled to inhale it. Care must be taken that the birds are not overpowered by the fumes. Luckily gapes are very rarely seen in this colony, and are due entirely to insanitary surroundings, the fault of the owner.

More Progress Wanted.

As these remarks will appear during the first month of the first year of a new century it will not be out of place to make a strong appeal to readers to do their best to foster the poultry industry; the success which will attend the adoption of improved breeds and methods will conduce to general prosperity.

Those who breed for market should set about the business in a more modern manner. Breed nothing but the best, and grade and pack in such a manner that buyers will be tempted into good competition. Isolated individual efforts will not build up a good trade. The sale of eggs of various ages and of poultry of all ages and qualities to hawkers is a poor way of doing business.

Let local breeders form an association for dealing with the matters of common interest. Combination of slender purses renders the purchase of good stock, incubators, mills, bone-cutters, &c., an easy matter, and these may be handed round to each in turn. More important is the regular disposal of carefully-graded, well-packed, fresh eggs which can be relied upon, as well as well-graded table birds. As these could be marketed in large numbers, and could be depended on, extra prices would soon be the result. There are numerous centres where the scheme would work well. Breeders in this colony often are too reticent in matters of common interest, and no good can be gained by such a course.

LOCUST DESTRUCTION.

From time to time—and far too frequently—there are complaints made by our northern settlers of serious damages done by locusts. “Wheat crops utterly ruined, orchards devastated, and gardens laid bare,” have been the reports received from many parts, together with requests for remedies to be adopted, or suggestions that the Agricultural Department should introduce “the locust fungus,” which is said to have been successful in coping with the locust plague in South Africa. From time to time the preventive and remedial methods adopted successfully in South Africa by the settlers have been published in these pages and elsewhere; but only in one case, so far as is known, has anyone ever attempted to test the efficacy of the remedial measures so recommended, and that one appeared to be successful, although tried on a very small area of locust infestation. Mr. A. Canning, Hon. Secretary of the Wilson Branch of the Agricultural Bureau, dissolved a little arsenic with soda, mixed coarse sugar with the solution, and soaked some chaff with it. This he scattered amongst the “hoppers,” and next day found numbers of young locusts dead adjacent to the bait.

Many people erroneously conclude that it is useless to kill the unwinged locusts, because their places will be filled by hordes coming down from further north. It is a truth that the locusts, before they become winged, eat more ravenously than when fully developed and winged. It is also true that before they develop wings they cannot travel far, and that they keep together in masses. Sometimes the flock of walking locusts will cover only a yard or two of ground, and other flocks may cover an acre or two. They congregate in this manner until they acquire wings, and at night they gather into close quarters under tufts of grass or other shelter.

Whilst they are in the wingless stage is the best time to attack them. If the air is quite humid and warm the locust fungus would be very effective, but such conditions seldom prevail in South Australia. In Cape Colony the humid condition often prevails, therefore the farmers are justified in their hopes of success with this remedy. But even in Cape Colony they are showing more reliance upon the poison, which does not need any particular atmospheric conditions to make it effective. The Inanda Locust Association Committee recently furnished a report, in which they made the following observations:—

All measures taken for the destruction of locusts in past seasons were only partially successful, with the exception of the plan of poisoning with arsenic, and this met with the most absolute and unqualified success. Although every publicity was given at the time to the success of the use of arsenic, very little seems to be known generally of this important

fact, and the principal object of the association in authorising a report is to give as full information as possible as to the effectiveness, cheapness, and safety of dealing with the young locusts by poison.

The evidence before the committee was so conclusive that they consider it to be established beyond doubt that the "hoppers," however numerous, can be destroyed in a few days by the judicious use of arsenic. Crops, therefore, need not suffer for months from the ravages of the "hoppers," and should the winged locusts from other districts swoop down later in the season, the crops will be vigorous and so be in a better condition to withstand any attacks. Again, arsenic is effective in destroying flying locusts, but not to the same extent as with the "hoppers," for the reason that the "flyers" come suddenly, feed, and are gone before the poison can be put down; still it should be kept ready for use, and put down upon any appearance of a locust flight.

The following testimony will be of interest. One man says:—"Last season, on 400 acres, I spent over £300 in driving the winged locusts to prevent, if possible, their depositing their eggs, and in digging trenches, and driving the young locusts, all with only partial success. Towards the end of the season I tried arsenic, and cleared my fields in a few days. This year I have let them feed, let them hatch, secure in the knowledge that by the use of arsenic I can kill all that hatch on my land, and prevent any which may come from adjoining lands from ever getting beyond my boundary clearing or fire-breaks."

Mr. Wilkinson, of Ottawa Estate (who was first to use arsenic with any success, and to whom the thanks of the colony are due), says;—"I had all hands killing locusts, and did very little good, and, from the time I began to use arsenic, an average of six men per diem, at a cost of 7s., with a few shillings for chemicals for the season, cleared my place (700 acres) in ten days, and kept it clear from inroads of locusts from adjoining lands."

The mode of application is as follows: Take 1lb. arsenic, 1lb caustic soda. Take 4galls. of water, bring to boiling point, add the caustic soda; when dissolved, add the arsenic, stir well and boil for a few minutes, care being taken not to inhale the fumes. Keep this mixture under lock and key. Take as required ½gall. of this mixture and add 4galls. of hot or cold water and 10lbs. of brown sugar. Dip bagass, grass, or maize stalks in this liquor and place along roads, in canefields, or anywhere about grass or low-growing crops, or splash with a whitewash brush on to anything which the locusts may be observed to have a taste for. Locusts will come from 100yds. or more, attracted by the smell of the sugar; they eat and die, and are eaten by other locusts, and, if they are taking the poison freely, in three or four days' time will be seen covering the ground with their dead bodies, or will be found where they have crept under grass or other cover to die. Some people recommend a much stronger solution than the above, which is that used by Mr. G. Wilkinson, and is the weakest in use; and, of course, if it is found to be equally effective with the stronger solution it is safer to use.

With regard to the safety with which this poison may be used, if the liquor is kept under lock and key, and due precautions are taken not to leave the sweetened liquor where any human being can get at it, but to take it direct to the fields, it will be seen that, once applied as directed, there is no chance of any human person being poisoned, and the small amount of poison in a piece of grass, bagass, or mealie stalk is not enough to injure stock of any kind—even fowls have been known to feed on the arsenic-destroyed locusts without hurt. Should any information with regard to the use of arsenic be required, any inquiries addressed to the Secretary of the Inanda Division Agricultural Association, Verulam, will receive attention.

The committee, in conclusion, would record their appreciation of the public service rendered by Mr. Arnold Cooper by his scientific researches into the diseases which are undoubtedly attacking the locusts in this colony, and they look with interest for his promised paper on the results of his further investigations.

Mr. J. L. Bisset, of St. Marks, South Africa, wrote the *Graaf Reinet Advertiser* that he had saved some fields of oats from the "baby locusts" by use of the following mixture, which is similar to the above and to what has been several times recommended in these pages:—

One pound of arsenic and 1lb. of washing soda, boiled in 10galls. of water. After boiling, add about 3lbs. treacle or sugar. Scatter green stuff in front of the swarm and then pour on the liquid with a watering can or spray. The locusts are very fond of this, and commence dying about twelve hours afterwards; thirty-six hours after the application 99 per cent. are dead. Mr. Bisset has during the week annihilated no less than eight swarms.

Where the liquid poison is sprinkled or sprayed on grass, it soon becomes dry and can be burned. Where chaff or green stuff has been scattered it would be

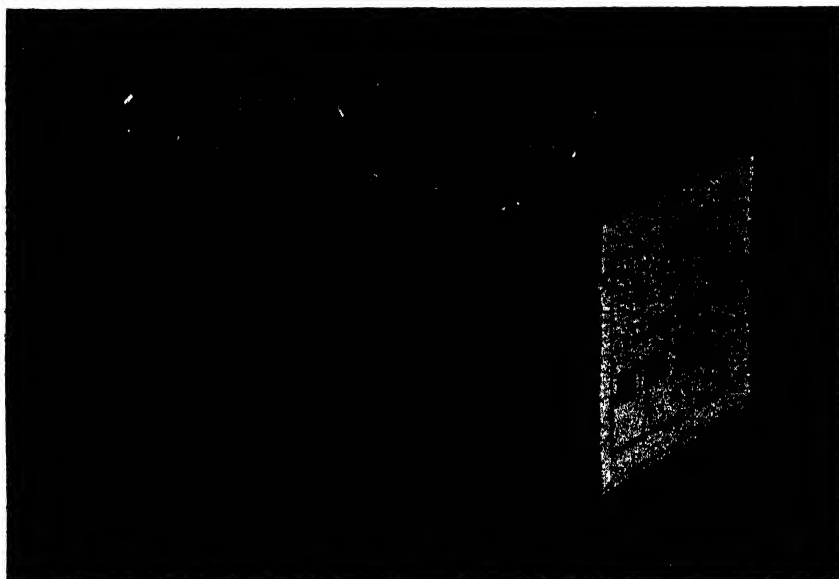
wise to keep stock off until heavy rain has fallen; but if the poison were scattered in plough furrows it would not be very difficult to fill up the furrows by means of a "scraper" affixed to a plough frame.

The flying locusts are, equally with the "hoppers," attracted by the sweetened arsenic bait, and it will be worth while to be prepared to test its efficacy when they appear "from the Far North"; but if every settler—including large holders of pastoral lands—will attack the hoppers from the time they are no bigger than fleas until they begin to fly, it will be safe to prophesy that "flying locusts" will be very scarce.

PACKING CHERRIES FOR INTERCOLONIAL EXPORT.

BY GEORGE QUINN.

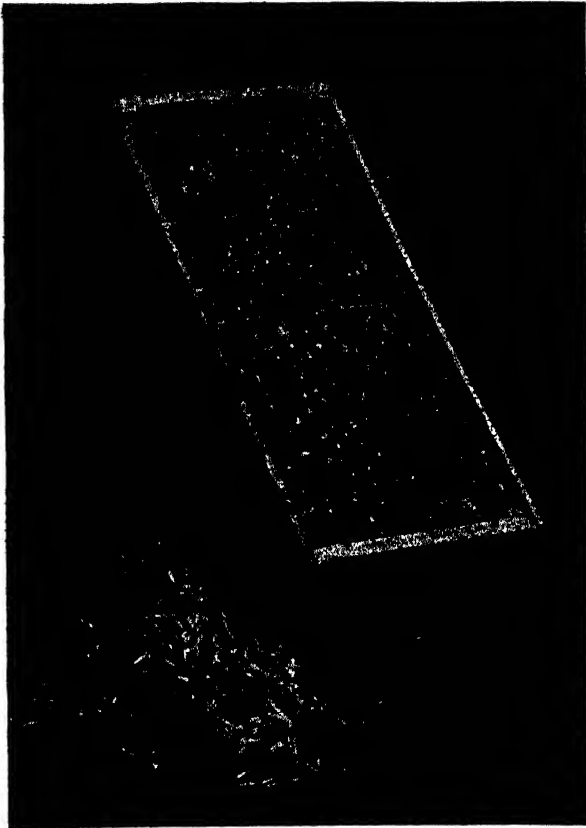
We are indebted to Mr. J. J. Bishop, of Elder Vale, Norton's Summit, for the opportunity of observing the keeping qualities of four leading varieties of cherries when packed in the manner found most successful for the distant transport of this easily-bruised fruit.



1. CASE OF CHERRIES PACKED FOR EXPORT.

On December 13 Mr. Bishop packed a crate or case in the manner adopted by him in his export trade to West Australia. This is as follows:—Size of crate, outside measurements, $27\frac{1}{2}$ in. long, $13\frac{1}{2}$ in. wide, and 11 in. deep; timber used in ends, $\frac{3}{4}$ in. thick; side laths, $\frac{3}{4}$ in. full. Three battens are used on the sides and four on top. The spaces between the battens are $\frac{3}{4}$ in. wide. This crate holds exactly twelve chip punnets, each of which has a capacity of $4\frac{1}{2}$ lbs. of cherries. The punnets are $12\frac{1}{2}$ in. long, $6\frac{1}{2}$ in. wide, 3 in. deep, and they are

fitted with a strengthening partition in the centre. A small external cleat, $\frac{3}{4}$ in. thick, is tacked on to the bottom at each end to prevent the upper punnet sitting tightly upon the contents of the one below it, and to allow of ventilation. The cherries do not project above the sides of the punnets. When one layer of punnets are placed in the crate a thin covering of paper shavings is placed over the fruit, and the next tier of punnets is placed in, and the top layer covered a little deeper—sufficiently to keep the contents firm—with paper shavings prior to the nailing down of the lid. The top is branded “On deck; this side up,” and the sender’s name stamped on the end. The crate was kept

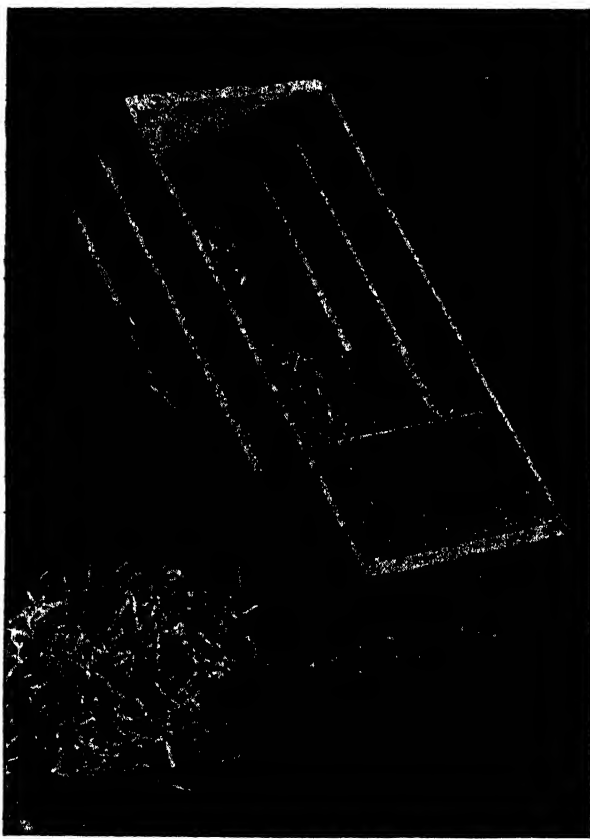


2 CASE SHOWING THE PUNNETS.

in this office from December 14 until December 22, covering a period of nine days, before being opened. The Biggareau Napoleon fruits had kept in the best condition, in some punnets only a small handful being unfit for consumption, and after being picked over the sample looked bright and attractive. The Waterloo variety remained in fair condition on the whole, though some punnets showed about one-third mouldy and decaying. Most of the St. Margarets were in poor condition, mouldy and unattractive when picked over. The Florence showed to very poor advantage, fully three-fourths being wasty and decaying, and on the whole the contents of this variety were valueless. Common mould

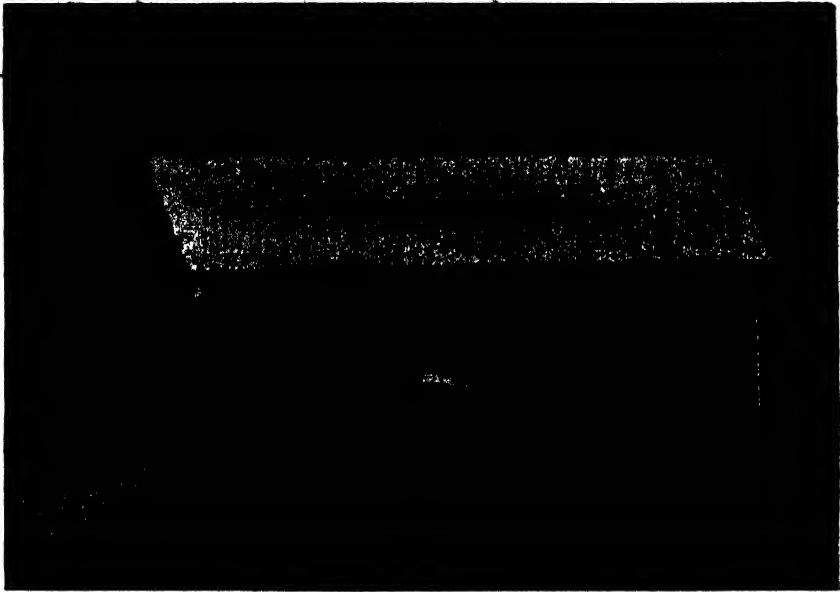
was very abundant upon the damaged fruits, giving them the appearance of having been packed slightly damp. Exposed to a current of air as they would be on a vessel's deck, mould would probably find less congenial conditions than in a fairly dark office where the air is still.

In the accompanying blocks No. 1 shows the crate packed ready for shipment. No. 2 shows the lid removed, with the protecting paper shavings lifted from the top. Plate 3 conveys an idea of the layers of punnets and the ventilating spaces between the battens of the crate. Plate 4 displays a punnet



3. CASE SHOWING VENTILATION SPACES.

tilted up to show the cleats on the bottom. The fruitgrowers of the future will no doubt be indebted to Mr. Bishop and others who have done the pioneering work of this kind here. With the expansion of the fruit trade—which inter-colonial free trade will no doubt facilitate—this method will probably receive greater attention in the future. This grower has this year shipped many hundreds of cases of cherries to the West. For any journey, however short, this system of packing is infinitely superior to the kerosene case almost universally adopted.



4. PUNNET USED FOR CHERRIES.

MILDURA NOTES.

The rabbit pest has assumed menacing proportions here, and vigorous efforts are being made to cope with it. Our orchards are invariably wire-netted, but the posts are almost as invariably flimsy; netting needs stapling up occasionally. The rabbit, too, sometimes learns to jump, and even climb over a double width of netting at a pinch. Considerable damage has been done in places to young and old vines, and the writer saw an orchard the other day in which peach trees had been clean barked to a height of 4ft. from the ground, the rabbits evidently climbing or jumping into the first fork, while big fig trees had been completely girdled at the butt. In this case there had evidently been gross neglect of fences. Various devices are resorted to for suppressing the pest. The favorite and most effective one, where the "lay" of the land allows of its adoption, is to flood out the warrens with water from the irrigation channels. The rabbits are waddied as they come up drenched and half drowned. Over 300 were thus killed the other day at one warren which had been temporarily netted in. Carbon bisulphide is used by some, sulphur fumes by others, and poisoned sticks by most. The shire council in a short time used no less than sixty bottles of strychnine in preparing sandalwood and young vine poison sticks, which were freely distributed among settlers. A posphorised pollard cart is generally at work, and the shire council is now busily searching for the most effective method for exterminating bunny. The crow, of course is doing yoeman work as scavenger, and the abundance of dead rabbits was said for a time to have had quite a marked effect in lessening his depredations in the orchard, usually very considerable on the early apricots and figs.

Prospects for the fruit season now opening are excellent, and Mr. W. B. Chaffey estimates that the yield will eclipse all previous Mildura records. The fruit months are always busy months for Mildura residents. With the first

week in December the apricot season may be said fairly to commence, as Swallow & Ariell's factory then begins to handle the Oullins and other early varieties, and with the Moorpark ripening towards the end of the month, the fun waxes fast and furious. No less than 120 hands are employed by this factory, while Messrs. Levien Bros employ between 80 and 100, exclusive of numerous pickers and field workers.

The first crop White Genoa figs are usually regarded with suspicion, although very large and luscious fruit, owing to the reputed tendency of the dried article to "powder," a result said to be due to incomplete pollination. At least one grower, however, has been very successful in obtaining a fine dried sample from the first crop, and considerable quantities are being bought by an enterprising person for drying purposes. Three pounds ten shillings a ton is the price paid for the fresh fruit. The factories are buying for jam at £3 the ton. The waste of figs in an average season is considerable, as the second or main crop of the Genoa does not make a good sample when dried, except with very skilful handling, and prices for inferior stuff barely pay for the labor involved. Nor has there hitherto been any adequate demand for the fresh fruit for jam-making or canning purposes. The great bulk of fig trees in the settlement are of the White Genoa variety, but where any planting is being done now it is with the Adriatic, which makes much more vigorous growth, is more prolific, and the fruit brings a much higher price when dried. The skin is still green when fully ripe, the inside is a luscious purple, and with ordinary care in drying a beautiful cream color is obtained, combined with an easy flexibility of skin. Experts declare it to be an inferior fruit to the true Smyrna fig, of which there is, as far as your correspondent knows, but one tree in Mildura which is said to have produced good fruit.

The Adriatic is being planted by some growers wherever a tree of other variety succumbs to the salt, as the fig survives and does well, even if it does not "flourish," in the salty soil. One grower claims to take from £5 to £7 worth of fruit off one tree every year, but that tree is not grown in salt-affected land.

Some remarks about the cow and pig industry in last month's notes might, without qualification, produce a false impression. It is true, as stated, that there has been no adequate attempt to meet the local demand for pork and butter, but a good deal is done in a small way. It is the common thing for settlers to possess a cow, and probably most married settlers keep one or two pigs. One dairyman has a herd of seventy milking cows, and keeps about 150 pigs, selling the pork to his customers. He is the one dairyman who, till recently at any rate, attempted much in the butter line. He owns a two-horse cream separator, and during the past twelve months several hand machines have been introduced into the settlement. Generally speaking, the standard of settlers' cows is a high one, some fine Jersey stock coming originally from Cudmore's Avoca station on the lower Darling having helped to attain this standard. Cows usually sell at about £8, but this year £10 has been frequently asked and obtained.

Pigs favored are the Berkshire and Tamworth, especially the former, and a cross between the two. Pure-bred Berkshires are not common, but some good blood has been introduced at different times. One successful pig raiser brought in some good stock from the Dookie Agricultural College, and your correspondent has this year imported a fine boar of the Angas breed, and a sow which was originally from the Roseworthy College herd, and also a boar of the famous Lord Chieveley strain.

Lucern is the settlers' stand-by for horse and cow and pig, with mangolds throughout the winter months. The creeping saltbush, so often alluded to in this journal, makes excellent summer pig feed, while throughout the fruit season large quantities of waste are obtainable from the factories.

The largest wine-grape grower in Mildura, Mr. W. B. Chaffey, who has many acres of Mataro among his 200 acres of vineyard, after last wine-making, bought a large herd of pigs and fattened them for the butcher by turning them to forage for themselves among the quantities of Mataro grapes left to dry upon the vines. The high price of pollard (1s. 3d. per bushel) which has ruled this season, due to the great demand along the river for phosphorising, renders pig-fattening somewhat expensive.

The compositor got my remarks about the single cultivators somewhat mixed. What was meant to be conveyed was that this implement is still supremely useful when the vines have spread so that it is not practicable to work a two-horse machine down the rows. The Gordo is planted 10ft. by 8ft., but, being pruned to within a few inches of the ground, the branches quickly spread to the point of interlacing across the 8ft. rows, and in rich soil meet across the 10ft. rows as well.

Topping is adopted by many, but with somewhat uncertain results, except as regards increased facility for cultivation. I believe that Professor Perkins deprecates this practice as weakening, and tending to cause undue second cropping. The second crop of raisins here is, however, an important factor in the total yield, and topping is adopted to that end. Your correspondent last year topped five acres, and left five acres untopped, but with no appreciable difference in the yield between the two lots.

The second irrigation of the season, which has been conducted at the rate of 200 acres a day, finishes on December 22nd, and the third pumping is expected to start on the 29th and to finish before the end of January. This has been a successful pumping, engines running on the whole very smoothly. Last watering there was a big break—the biggest in the history of the settlement—which necessitated sending a large shaft from the billabong engine to Bendigo, and delayed the watering a fortnight. Cool weather prevailing at the time little damage was done, but the consideration of what might have resulted had this accident occurred during a hot spell had a sobering effect on both settlers and Commissioners, and every effort will be made in future to keep necessary duplicate parts in stock.

The Irrigation Trust is making strenuous efforts to bring expenses within receipts from water rates, but we have not yet reached that consummation, and still depend on Government assistance. An increase in the pound an acre water rate is contemplated, and will possibly be necessary, but the gradual influx of new settlers and the anticipated saving from the concreting of channels and other work effected by means of Government loan will tend towards equalising matters. Titles to numerous town lots and blocks are being handed over to the Trust for sale, back water rates being thus wiped off and, it is hoped, solvent ratepayers secured. For the first time since the existence of the present Irrigation Trust a high river during the first pumping kept the billabong full, and allowed the monster pump at Psyche Bend to remain idle, thus affecting a considerable saving in the cost of that irrigation.

With the river so high during spring and early summer, a long continuance of water traffic was hoped for, but the waters have fallen very rapidly, and the river will probably be closed by the New Year. Great quantities of pulped and canned fruit are being hurried away on the falling river, but we shall again have to wait some months for dried fruits to be put on the market.

The Dried Fruits Trust has fixed the export proportion of apricots at 25 per cent., and, as usual, a large amount of fruit is being dried on the New South Wales side of the river, in order that the duty may be escaped. The fixing of an export proportion is adopted as a precaution against the glutting of the Victorian market.

TO RID THE HOUSE OF FLIES.

There is no class of insects more annoying to our personal comfort than the various flies which frequent our houses, offices, creameries, &c. How to get rid of them is often a puzzling question. The department of entomology, after experimenting upon various mechanical devices for catching flies, has contrived a trap, and recommends it for trial on account of its effectiveness and cheapness. Anybody with an average of mechanical ingenuity can make and attach the trap with the cost of but a few cents. It is made as follows:—

Take a flat strip of tin $2\frac{1}{4}$ in. wide and $1\frac{1}{2}$ in. longer than the distance between the side rail or stile and middle rail of the sash, as from *c* to *d*, Fig. 3, which in

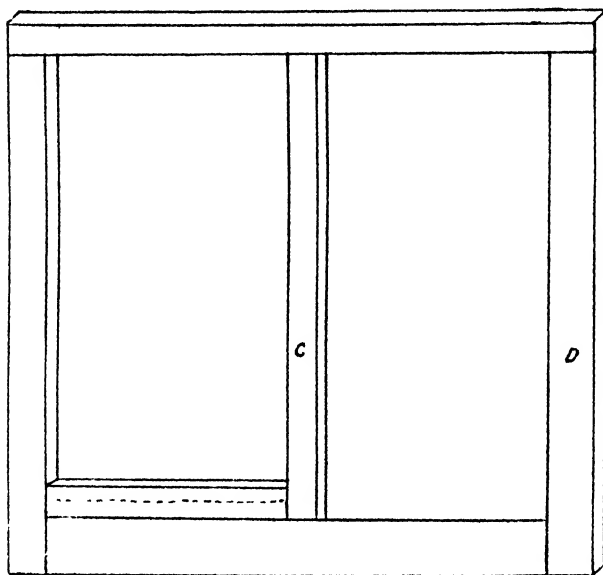
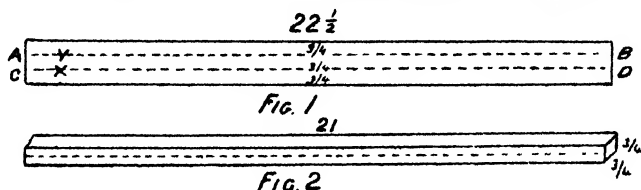


FIG. 3

this case measured 21 in. For this window the strip must be $22\frac{1}{4}$ in. in length. With the tin lying on a flat surface, bend the tin along the lines *ab* and *cd*, Fig. 1, which are three-quarters of an inch from their respective sides, so that the space *abdc* forms the bottom of a box and the lateral parts the sides. To close the ends, cut small incisions three-quarters of an inch deep at the points *a*, *b*, *c*, and *d*, as *ay* and *cx*, Fig. 1. Bend the flaps thus made at right angles to their respective parts. We then have a box 21 in. long, $\frac{3}{4}$ in. wide, and $\frac{3}{4}$ in. deep, as at Fig. 2. To make the box watertight, solder the joints, or if solder is not handy try moistened plaster of Paris. When properly made the box should fit snugly between the middle and side rail or stile. The corners should

be square and the edges straight, so as to leave no passage ways between the box and the glass. The box should rest on top of the bottom rail, and can be held in place by two or three tacks or pins thrust into the rail from the back side. When the pane is very large it is well to attach another trap half-way between the top and the bottom.

After the traps have been attached some substance should be put into them that will either kill the insect upon falling into it, or, on account of its sticky nature, will hold the insect so that it cannot escape. For the first kerosene, kerosene emulsion, soapsuds, and pyrethrum are the best, and for the second molasses or a mixture of castor oil and resin. For general use soapsuds are to be recommended. When using the liquids fill the traps two-thirds full. Kerosene is most fatal to flies, but should be used with care, as it is very liable to soil the sash. In using it fill the traps half full of water, and then add enough kerosene to form a film on the top.

There should be one trap for every pane of glass in at least one window in the house. For instance, when the sash contains two panes of glass, as in the illustration, there should be two traps, one at the base of each pane; when the sash contains four panes there should be four traps, two on the bottom rail and two on the crossbars or mounting. It is not necessary to apply traps to all the windows; attach the traps to one or two windows in the sunny part of the house and pull down the blinds of the remaining windows. The flies will seek the lighted rooms, and especially the windows. When the traps are full remove them from their fastenings, empty out their contents, and fill them with fresh material. A temporary trap can be made of flexible cardboard, following the same directions as for those made of tin. Use glue or pins to fasten the ends. To render the trap waterproof paint the inside with melted paraffin. This will hold any of the above remedies except the pure kerosene.—Percy J. Parrott, in *Kansas Experiment Station, Bulletin 99*.

REDUCING BONES WITH QUICKLIME.—Bones are easily softened by mixing them in heaps with quicklime and loam in the following way:—Place in a convenient position on the ground a layer 6in. deep of bones, then a layer 3in. deep of lime, and then a layer about 4in. deep of loam, and so on, repeating until the heap is made of convenient height, when it should be covered up with a thick layer of earth. Holes should then be bored into the heap from the top, and water poured in to slake the lime. The mass will become hot, and remain so for two or three months, after which the bones will be found very friable, and the whole heap may be mixed together, when it is ready for applying to the land. This mixture is a valuable fertiliser for many crops.

A NEW SKIM-MILK PRODUCT.—According to an American contemporary, lactroid is the name of the new product made from skim milk, and is intended as a substitute for hard rubber, celluloid, and other similar articles. When in the pure condition it is a translucent hard substance, resembling ivory in appearance, but it is sufficiently plastic under proper conditions to allow of its being moulded under pressure. It can be turned easily on a lathe, and worked with properly cutting tools. By mixing with various kinds of pigments, &c., it can be made in any shade desired. It is remarkably dense, tough, and strong, practically unflammable, not as easily injured by heat as hard rubber, and not affected by the various solvents which attack celluloid, rubber, and cheap substitutes. It is destined to be used largely for combs, brush backs, piano keys, telephone receivers, and in various electrical work, as it has remarkable insulating powers. Its low cost and the practically inexhaustible supply of raw material will do much towards bringing it into extensive use and popularity. The process of manufacture, which has been perfected by William A. Hall, of Vermont, is a secret one.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, DECEMBER 17, 1900.

Present—Mr. F. E. H. W. Krichauff (Chairman), Sir Samuel Davenport, Hon. A. W. Sandford, M.L.C., Messrs. S. Goode, W. C. Grasby, Thos. Hardy, M. Holtze, H. Kelly, C. J. Valentine, and Secretary (A. Molineux).

Licensing of Stallions.

The Hon. Minister forwarded correspondence in connection with proposal for veterinary examination of stallions and bulls offered for hire, and intimated that the matter would be dealt with in connection with the new Local Government Bill.

Mr. GOODE thought too much importance was laid on the soundness of the sire, as in his opinion it was equally necessary that the dam should be first class. The breeding of good draught stock should be encouraged, as it would prove profitable to landowners. In England good draught horses readily fetched from £80 to £200 each, and "suckers" from £25 to £50.

Zante Currants.

Mr. HARDY tabled two bunches of Zante currants, one from a vine which had had a ring of bark about a quarter of an inch in width removed from the stem at flowering time, and the other from an untreated vine. The bunch from the "cinctured" vine was full and regular, and in marked contrast to the other, which contained more small grapes than regular sized ones. Mr. Hardy stated that the "cinctured" vines would yield at least 50 per cent. more currants than the others. The check caused by the removal of the bark induced a regular setting; the wounds made healed over quickly. They were indebted to Mr. Grasby for calling attention to this practice, which had been adopted for many years in the currant-growing districts of Greece.

Curculio Beetles.

Mr. HARDY stated that Mr. J. Hague, of Clare, had adopted a very successful plan for trapping curculio beetles. These insects were attacking his fruit trees in considerable numbers, and doing much damage. He placed round the stems bandages of the same character as used for trapping the codlin moth caterpillars, but instead of the folds of the bandage opening downwards, they were just the reverse. The beetles, in leaving the trees, got between the folds of the bandage and remained there.

Members thought the plan a very good one, and worthy of a good trial. The SECRETARY said that in addition to the nocturnal curculio (*Otiorrhynchus sulcatus*) the native curculio (*Desiantha maculata*) was reported from several localities to be very plentiful. It appeared to feed in the day time as well as at night, and was quite as destructive as the other.

Deterioration of the Potato.

Mr. VALENTINE said a matter that had impressed itself upon his notice was the marked deterioration in the quality of local potatoes during late years. Twenty years ago it was usual to get potatoes of good quality, but now it was very exceptional to get really first-class potatoes. The Mount Gambier

potatoes, in particular, had greatly deteriorated. He did not know what was the cause, but probably the continued cultivation of the same land might be partly responsible.

Mr. SANDFORD agreed that a lot of the Mount Gambier land was potato sick. There had undoubtedly been a marked deterioration in the quality of the potatoes grown both here and in the Warrnambool district. There was no doubt that it was also partly due to trade conditions, as buyers will give within a few shillings per ton of top values for the poorest quality potatoes. The average difference in the price of the different kinds of potatoes at Mount Gambier for the season did not exceed 1s. per ton. Take the variety raised at Mount Gambier known as Plunkett's Seedling. This yielded much more than many varieties of far greater cooking value, but as the price offered was practically equal to others it was naturally planted by the growers. It was really sacrificing quality for quantity. His experience of the potato trade was that the tubers from the newer soils were invariably of better quality, and fetched from 25s to 55s. per ton more than from the old districts.

The CHAIRMAN asked why Circular Head potatoes should keep up their quality for so long.

Mr. SANDFORD said much of the land that produced Circular Heads thirty years ago was now used for grazing, and each year new land was being opened up for potato-growing. Owing to better facilities for transport, potatoes were grown further inland. He was convinced that the use of comparatively new land was the cause of the maintenance of the quality of the potatoes.

Mr. GRASBY said that of the varieties of potatoes imported by the Chairman at least six promised, after three years' trial, to come into general cultivation, owing to their good qualities.

Extracts and Translations.

The CHAIRMAN tabled the following :—

Hessian Fly (*Cecidomyia destructor*), although yet unknown here, may suddenly make its appearance, as it did in Germany in 1894, whence it almost disappeared in 1896. The devastation effected by it is at times frightful, as was the case in Ohio, U.S.A., in 1899 and 1900. The loss on an average crop of wheat there may be largely charged up to the ravages of the Hessian fly. Ohio has an average crop of 40,000,000 bush., and the loss of 32,000,000 bush. means a loss of \$16,800,000. Its females lay from eighty to ninety eggs, mostly one or two only on each of the lower leaves. The maggot crawls downwards, and eats from one of the lower knots, which thereupon makes the haulm break. The pupa, however, remains in the flag sheath many months before the fly makes its appearance. High stubbles and the burning of them seem the best remedy. The pupa has the appearance of a flax seed. The mealy wheat of Ohio is said to be less subject to the fly than others.

Nitrate of Soda for Potatoes. Dr. Tancre, of Holstein, says—"On heavy soils not so much should be given as upon light porous soils. On the former it must be given at once, or shortly after planting; to the light soil not before the first plants appear, and then a light harrowing is advisable. One morgen (a little more than half an acre) planted with the new German kinds should produce at least 120 cwt., and with 120 cwt. of farm dung of 0.5 per cent nitrogen, of which 40 per cent. may act during the first year, and 10 lbs. to 20 lbs. of nitrogen available from previous manurings, require not less than 100 lbs. of nitrate of soda. Medium or late varieties may improve if the nitrate of soda is given in two lots."

New Members.

The following gentlemen were approved as members of the undermentioned Branches :—Tanunda, Mr. W. Liddiard; Arden Vale, Messrs. J. H. Williss, W. Williss, and O. E. Hannemann; Rhine Villa, Mr. R. Start; Forest Range, Mr. A. Brockhoff; Mount Gambier, Messrs. T. S. Brown and J. Kennedy.

Reports of Meetings.

The SECRETARY reported receipt since previous meeting of fifty-seven reports of Branch meetings.

REPORTS BY BRANCHES.

Mundooro, November 9.

Present—Messrs. R. Harris (chair), J. Loveridge, H. Haines, W. Aitchison, J. Blake, D. Owens, W. D. Tonkin, W. J. Shearer, J. J. Vanstone, C. H. Button, W. Mitchell, A. E. Gardiner (Hon. Sec.), and one visitor.

MANITOBA WHEAT.—Mr. Aitchison wished to know the reason for Manitoba flour fetching higher prices than South Australian, and could the wheat be grown successfully in these colonies. Mr. Beck (visitor) had seen this wheat growing in New South Wales, and believed that it failed to keep its peculiar qualities after two or three years' cultivation. [The reason for the higher price given for Manitoba flour is that it is "stronger" than ours, that is, a given weight of flour will make a greater weight of bread. It remains to be proved whether the wheat will retain its characteristics under cultivation in Australia. Several years ago the Bureau obtained seed of Duluth and Manitoba wheats, but nothing was done with them, as the grain was smaller and darker than some of our own wheats which were rejected by buyers here.—GEN. SEC.]

BUNT IN WHEAT.—Mr. Vanstone tabled three sheaves of wheat, being the result of some experiments carried out by himself to demonstrate the efficacy of bluestone pickle for prevention of bunt in wheat. Equal quantities of Dart's Imperial wheat were treated as follows:—One lot was rubbed, dry, with a bunt ball and sown without pickling; result, fully 30 per cent. of the crop is affected. A second lot was infected in the same way, but pickled in bluestone solution; result, only 2 per cent. infected. A third lot was dipped in the pickle together with a bunt ball, which was afterwards crushed with the grain; result, quite 20 per cent. was affected by bunt. Mr. Vanstone said he had always been a strong believer in pickling, and in future he would exercise more care, and if possible remove every bunt ball from the seed before pickling. The third experiment proved that the spores in the unbroken bunt balls were not affected by the pickle, and that the seed was reinfected when these balls were broken in sowing or otherwise. Members thanked Mr. Vanstone for his interesting demonstration of the necessity for pickling and for the exercise of care in the operation.

WHEAT EXPERIMENT.—Mr. Button tabled fine sample of Ranjit wheat from Bureau seed. The wheat was 5ft. high, with well filled heads, and members were highly pleased with its appearance.

Forest Range, December 6.

Present—Messrs. J. Vickers (chair), A. Green, J. Green, J. C. Jennings, J. Rowley, J. G. Rogers, O. Kumnick, H. Waters, J. Caldwell (Hon. Sec.), and one visitor.

EXHIBITS.—Mr. J. Green brought in a kind of tuberous rooted grass, supposed to be the knot-grass (*Cyperus rotundus*). The tubers are about the size of a pea flattened, and growing as if threaded on the root close to the stem. The stems of the grass are rather purplish green at the bottom, rather woody, and jointed, the joints, or nodes, being dark purple.

BOTFLY.—The Hon. Secretary tabled a fly with extended tapering abdomen, which he thought to be the botfly.

CATERPILLAR PEST.—Members report prevalence of a caterpillar similar to that found on raspberries which is eating into the apples. [This is probably the caterpillar of the *Cacaesia* moth, long, slender, green, very active when disturbed, and wriggles rapidly backward or forward. Spray with Paris green. The moths are easily attracted to a light.—GEN. SEC.]

CONSTRUCTION OF AN APPLE HOUSE.—Mr Rogers read the following paper :—

In constructing an apple shed it is advisable to have as level and dry a place as possible to build on. The material used in building it may be concrete, stone, wood, iron, or bricks. The storehouse I am about to describe is to be built of bricks, 40ft. long x 20ft. wide x 10ft. high, and capable of holding about 3,000 bush.; each wall to be built with a 2in. cavity in the centre, and tied together with hoop iron every 4ft. apart, turning the ends of the hoop iron up a little so that it will hold in the frog of the brick. By building the walls hollow in this manner it will prevent any damp coming through. When the walls are up 8ft., build in the joists for carrying the loft floor. Then build up the walls the remaining 2ft. to carry the roof. By keeping the loft down 2ft. below the wall-plate, it will be found more convenient than having the loft on a level with the top of the walls. In one end build in three windows, one in the gable to light the loft, and two in the lower part of end wall opposite the passages. At the other end of the building, in the lower part, put in a large sliding door to run on rollers at the top end; also above the door fix a smaller door to loft—this may be hung on hinges; also fix a small landing stage 6ft. long x 3ft. wide on a level with loft floor. When putting on the roof, let the ridge board project out at the door end sufficient length to carry a pulley block for hauling and lowering cases to and from the loft. It would be a good plan to put down two strong posts in a line with the side walls, say 15ft. or more from the end wall, and continue the roof on to whatever distance you put your posts. This would make a good open shed for driving the trolley in and out when filling or emptying the storehouse. A good cement floor is best. The shelves should be fixed on skeleton frames, one row on each side of building, 8ft. wide; one row down the centre of building 6ft. wide, leaving a 4ft. passage between each side and centre shelves. There could be two or three rows of shelves as desired. The centre row of shelves not to go the full length of building, but to be kept back 10ft. from the door end, which would give a space of 14ft. x 10ft., which would be handy for sorting and packing apples for export and other purposes. In one corner of this space fix stepladder for entering the loft through trap door. A rough estimate of the cost of materials to build such a storehouse as I have described amounts to about £65.

Mr. Vickers thought if banana cases were used, in place of shelves, they could be readily taken out for scalding; but Mr. Rogers said the shelf boards could be 5ft. long and easily taken out for scalding.

Meadows, December 5.

Present—Messrs. W. Pearson (chair), G. Usher, W. J. Stone, T. A. Buttery, G. Rice, G. Ellis, J. W. Vickery, F. W. Dohnt, T. B. Brooks, W. Nicolle, D. D. Murphy (Hon. Sec.), and four visitors.

EXHIBITS.—Mr. Stone tabled a spray of Napoleon Bigarreau 1ft. long, and containing about 200 very fine cherries.

CULTIVATION.—Mr. Nicolle read a short paper on this subject. He advocated thorough cultivation of small areas in preference to muddling with large blocks. He recommended alternating with peas and hay, manuring for peas with 3wt. or more per acre of bonedust. Land should be ploughed deeply whilst mellow, but never when it is sodden. He would scarify the seed in, else it would not be buried deeply enough.

Rhine Villa, December 1.

Present—Messrs. J. Vigar (chair), H. Mickan, H. Groth, W. Farey, C. Groth, Allan Payne, G. Schick (Hon. Sec.), and one visitor.

"HIGH PRICES OF PEDIGREE STOCK."—Mr. H. Groth read a paper under this heading. The following is a rough abstract :—He thought it is important to find out whether the real value of pedigreed stock is commensurate with the prices asked and often paid. Very high prices are frequently paid for sheep by men who know little about their value because some others who pose as authorities say they are worth it, whereas the value is fictitious in many cases.

The value of a ram or ewe should be determined by the quantity and quality of wool and mutton they will produce, and their power to transmit to their progeny unimpaired the good qualities for which they are distinguished, when supplied with an adequate supply of suitable food. If the land is incapable of supporting very large heavy framed heavy fleece-producing sheep, but will readily sustain a number of much smaller and cheaper sheep, producing individually less than one-third the amount of meat and quantity of wool, but in the aggregate yielding as much wool and meat as the bigger and more costly sheep, it would seem to be economical to keep and breed the latter. If some sheep convert their food into wool, whilst others make meat at the expense of wool, probably the one will balance the other on either side when the meat or the wool is marketed. He imagined the same line of argument would apply to large cattle, both for beef and for the dairy. Healthy "good doers" should be sought for, those which make the most of the food consumed and give the best returns are the animals which it is most desirable to secure.

Wilmington, December 3.

Present—Messrs. J. Hutchens (chair), W. Slee, M. Gray, J. Zimmermann, J. Lauterbach, J. Schuppan, J. Hannigan, J. McLeod, F. Bauer, R. G. S. Payne (Hon. Sec.), and two visitors.

DAIRY BULL.—Arrangements were completed for purchase of pure-bred Shorthorn bull of a good milking strain for service in the district.

SEED WHEAT FOR DESERVING FARMERS.—The Chairman referred to question for special consideration that evening. In this district they had obtained fair returns for their labors during the past year, but in some of the adjoining districts the farmers had suffered another failure, and he thought the Branch might do something to help them by collecting seed wheat for distribution. All those present sympathised with the Chairman's remarks, and it was resolved that seed wheat and cash with which to purchase seed be solicited throughout the district, and that the General Secretary be asked to bring the matter under the notice of other Branches, inviting their co-operation.

Millicent, December 6.

Present—Messrs. R. Campbell (chair), H. Oberlander, G. Mutton, H. A. Stewart, H. Warland, H. Hart, W. J. Whennen, and E. J. Harris (Hon. Sec.).

BRANDING OF SHEEP.—The Chief Inspector of Stock wrote that he agreed with the Branch that sheep sold out of pound should be fire branded, and would bring the matter forward when the draft of the new Brands Bill was dealt with.

FODDER GRASSES.—Mr. G. Mutton reported seeds from Bureau were doing well. Johnson grass was thriving on the Wyrie. Some difference of opinion existed as to quality, &c., of Kentucky Blue grass as a fodder for this locality. Members spoke highly of Napier fescue (*Festuca elatior*), and were surprised that it was not more largely grown. Mr. Hart had this grass doing well on white sandy land, and was saving all the seed possible for further seeding.

AGRICULTURAL SHOWS.—The Hon. Secretary drew attention to question of undesirable adjuncts to agricultural shows. Members deprecated the practice of offering prizes for "buck-jumping" contests, and were also opposed to the practice of admitting side shows of various descriptions on the show grounds. They thought these militated against the educational influence of the shows.

DEHORNING CATTLE.—Mr. Stewart stated that the calves upon which he used Greenbank's caustic soda about twelve months ago had no signs of horns.

Cattle that had been dehorned were very quiet. He had completely cured an old bull who was a notorious fencer by removing his horns. Some difference of opinion existed as to the practice of removing the horns from old stock. It was stated that the experience of Messrs. Riddoch was that such cattle fattened much better than horned stock, and there was no trouble with butting or bunting.

DEEP CULTIVATION.—The Chairman directed attention to discussion at meeting of Port Elliot Branch. Two cases showing the benefit of deep cultivation had come under his notice lately, splendid crops of wheat being obtained on deeply worked soil. He failed to understand why a man who turned up his garden to a depth of 6in. to 9in. to grow cabbages for the use of the household should consider it sufficient to plough only 4in. or 5in. when growing them for his stock. Mr. Hart believed in gradually deepening the cultivation each year; he had seen injurious results from deep ploughing.

CO-OPERATION.—The Chairman directed attention to the General Secretary's statement that at the recent conference *re* standard samples of wheat he had refrained from voting because if Professor Lowrie's motion had been carried the wheatbuyers would refuse to deal except on the old system, and farmers were not sufficiently united to take the matter in their own hands. Mr. Campbell particularly emphasised the latter portion of the statement, but hoped the day was not far distant when farmers would be sufficiently united to take a firm stand on a matter of so great importance, and if necessary do their own exporting.

Mount Remarkable, December 6.

Present—Messrs. A. Mitchell (chair), G. Yates, W. Lange, C. E. Jorgensen, T. P. Yates, H. N. Grant, D. Roper, W. Morgan, T. S. Bishop, and T. H. Casley (Hon. Sec.).

EXHIBITS.—Mr. T. P. Yates tabled the following wheats, which were considered good and suitable for the district:—Marshall's Hybrid, Silver King, Ranjit, Majestic, and Bartlett's Crossbred.

CHEMICAL ANALYSIS OF SOILS.—Mr. D. Roper read an essay upon this subject, in which he dealt with the classification of soils as sandy, loamy, &c.; organic and inorganic matter; the partial exhaustion of soil by constant cropping, without restoration of constituents removed; the necessity for a knowledge of what is required for production of each crop, and of what quantity of each such constituent is to be found in the soil upon which such crops are to be grown. He mentioned the principal inorganic and organic constituents of a good, well-balanced soil, and remarked that a knowledge of these requirements and supplies would enable an intelligent farmer to approach the subject of manuring with a degree of certainty not possessed by another who is not equally well informed.

Forster, December 4.

Present—Messrs. J. Childs (chair), J. Sears, C. Payne, A. Schenscher, John Johns, and E. Schenscher (Hon. Sec.).

ANTIDOTE FOR PHOSPHORUS POISONING.—Mr. J. Sears said it has been proven in at least half a dozen cases that bicarbonate of soda is a remedy for phosphorus poisoning. When a beast has taken phosphorus baits administer from one to two tablespoonfuls of carbonate of soda dissolved in a winebottle of water, and repeat two or more times at intervals of four hours.

WHEAT-FOUNDERED HORSES.—Mr. Childs said carbonate of soda is a remedy for founder in horses caused by eating wheat. [It is a remedy for

bloat in cattle, in tablespoonful doses dissolved in a winebottle of water.—GEN. SEC.] During hot weather great care is necessary with horses, for if worked after they begin to puff it will probably cause their sudden deaths.

UTILISATION OF SCRUB.—Mr. A. Schenscher read the following paper :—

There is a very great consumption of firewood in Adelaide and the colony generally all the year through, and this article is becoming exceedingly scarce in many parts. Farmers in this district should save the whole of the mallee and roots when clearing their land, and stack it all in an open place where fire cannot come near it. Within a short time it will be possible to contract with firewood merchants in Adelaide. They have been paying 8s. 6d. per ton quite recently for wood loaded on trucks at Murray Bridge. The freight from Forster to the Bridge is about 1s. per ton, and about 9d. per ton would be charged for loading it on trucks. This would leave 6s. 6d. per ton to the farmer after paying expenses.

Tatiara, December 1.

Present—Messrs. W. E. Fisher (chair), A. D. Handyside, M.P., E. Proscott, F. Smith, and T. Stanton (Hon. Sec.).

DAIRYING.—Discussion took place on question of purchase of pure-bred bull for service in the district. Mr. Handyside agreed to make necessary inquiries.

Nantawarra, December 5.

Present—Messrs. J. Nicholls (chair), H. J. Spencer, R. Nicholls, S. Sleep, J. W. Dall, A. F. Herbert, G. Belling, R. Uppill, E. J. Herbert, and T. Dixon (Hon. Sec.).

FARMERS' CO-OPERATIVE UNION.—A lengthy and animated discussion took place upon the subject of more actively supporting the Farmers' Co-operative Union. For the sake of argument Mr. Dall advanced the suggestion that the union was shutting out competition. He had noticed in other townships where the union was not so strong more competition was taking place amongst wheat-buyers, and better prices prevailed. The Hon. Secretary did not agree with this, as he obtained better prices now for his grain than he did before the union was established here, and felt confident it was to the advantage of the farmers to support the union. Mr. E. J. Herbert said he received an advance in price of 5d. per bushel when the union first opened, but the other buyers quickly came up to the mark, and even rose 1d. per bushel higher than union rates. He cited cases where 4d. per bushel more had been received for wheat stored with the union than could be got for wheat stored in other warehouses. Mr. Sleep said he had suffered a loss of 5d. per bushel on wheat stored with buyers not connected with the union. The Chairman said that prior to the establishment of the union there were five buyers in Port Wakefield, and if they each received £3 per week that £15 per week had to be paid by the farmers for the benefits of competition with their own union run with only one buyer. Mr. R. Nicholls thought that whilst they were running their own affairs they should always try to secure the best prices for their produce, wherever obtainable.

EXHIBITS.—Mr. Spencer showed samples of Marshall's Hybrid, Majestic, Silver King, and Ranjit wheats, raised from seed sent up from Central Bureau. These were all sown at the rate of 35lbs. seed per acre on land treated with 150lbs. Lawes' super. They all suffered from hot weather—Silver King the most, and Ranjit the least.

IMPACTION OF OMASUM.—For "dry bible" in cows Mr. G. Belling was recommended to try bone meal mixed in bran mash with a little sulphate of iron.

Mount Compass, December 13.

Present—Messrs. M. Jacobs (chair), F. Slater, F. McKinlay, W. Gowling, S. Herring, R. Cameron, A. R. Cameron, C. S. Hancock, A. J. Hancock (Hon. Sec.), and one visitor.

SEASONABLE OPERATIONS.—Plant potatoes, cabbages, cauliflowers, and celery. Sow seeds of cabbage and cauliflowers, turnips, swedes, peas, beans, carrots, and parsnips; also salad plants.

RAINFALL.—For November, 0·97in.; for year till November 30th, 39·10in.

QUESTIONS.—Mr. Jacobs had an orange tree about 5ft. high, the fruit of which drops off when about the size of a marble. Mr. F. McKinlay made a similar complaint in respect to a three-year-old peach tree. [In both cases the trouble is probably due to the over-stimulation of wood production. The locality is not particularly favorable for either oranges or peaches.—GEN. SEC.]

THE APPLE INDUSTRY.—Mr. A. J. Hancock read a paper in which he referred to the large area of land in the district that is well suited for apple-growing. Much of that land is timbered, and it would involve labor and expense to clear. Owing to the absence of railway communication at present it would not be possible to convey the wood to a centre of population, and it would therefore be necessary to burn it on the land, except what could be used for posts and rails. Stringybark trees should be killed by ring-barking some time before grubbing, as the roots soon decay and make the work easier. The stumps must be got out before the land can be ploughed or dug. The apple trees must be young, clean, strong, and healthy, and of the sorts which sell best and give the heaviest crops of best marketable or export fruit. He thought Rome Beauty, London Pippin, Rymer, Jonathan, Cleopatra, Strawberry Pippin, and Scarlet Nonpareil best suited to the locality, but Cleopatra must not be planted on low-lying ground. The trees must be on low stems, say, not over 2ft., with three or perhaps four strong arms, pruned back to two or three buds on each. There are many little details in management and treatment of the different varieties which can only be learned by observation and practice.

Cherry Gardens, December 11.

Present—Messrs. R. Gibbins (chair), T. Jacobs, C. Lewis, J. Lewis, G. Brumby, S. Richards, J. Metcalf, A. Broadbent, and C. Ricks (Hon. Sec.).

WEED.—It was decided to ask the Clarendon District Council to endeavor to have the weed *Hypericum canariense*, growing at Coromandel Valley, declared a noxious weed in order that steps might be taken to have it destroyed before it spreads any further.

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the past year twelve meetings were held with an average attendance of 8·7 members. This was the lowest average since the inception of the Branch, and he hoped that the coming year would show a better record and increased interest taken by the members. Each member can, if he will, help to make the meetings distinctly beneficial to his fellow members, and should look upon it as his duty to do his utmost in this direction. The Chairman and Hon. Secretary were thanked for their services and re-elected.

FRUIT-GROWING IN THE HILLS.—The Hon. Secretary referred to the possibilities of the fruit-growing industry, and also the necessity for improved methods of distribution. Take the price of cherries this season—down to 2s. per case of 60lbs., and peas at 1s. per bushel; yet how much of locally-preserved cherries and peas can be purchased in Adelaide? There are large quantities of preserved fruit and vegetables imported from America and France, and our own

neglected. Then take the possibilities of the market in West Australia. Cherries have been this season sold at Fremantle at 1s. 4d. per pound, and strawberries at 2s., while at same time these fruits were selling at from $\frac{3}{4}$ d. to 1d. per pound and 6d. per pound respectively in Adelaide. On the West Australian goldfields these fruits were practically unknown to the bulk of the residents. He looked to the work of the Branches to so improve methods of treatment and distribution to deal with these matters.

Watervale, December 3.

Present—Messrs. C. A. Sobels (chair), H. Beck, G. Hunter, E. W. Castine, S. Solly, G. Holder, H. Scovell, H. Croft, and E. Treloar (Hon. Sec.).

SEASON.—Members reported that the grape vines, especially Zante currants, promised a very heavy crop. Some heavy crops of hay have been cut. It was decided to endeavor to get the "cabbage" train to Broken Hill stopped at Mintaro, in order to give growers in this district an opportunity of forwarding fruit and other produce to the Hill.

Mount Gambier, December 8.

Present—Messrs. J. Watson (chair), W. Barrows, J. C. Ruwoldt, W. Mitchell, T. H. Williams, Jas. Bowd, D. Norman, M. C. Wilson, and E. Lewis (Hon. Sec.).

LABORATORY.—Mr. J. T. Morris, M.P., wrote that £20 had been placed at disposal of the Branch for erection of a room to be used by Inspector Williams, in lieu of a bacteriological laboratory.

OFFICERS.—Mr. Watson was elected Chairman and Mr. Wilson Vice-chairman. Mr. E. Lewis consented to continue as Hon. Secretary.

BUSINESS.—It was decided to commence the new century by adopting the committee system for discussion of any subjects that will admit of such a course. It was also decided to form classes of young agronomists, if possible, for the study of diseases of live stock, plants, &c., and for the acquirement of practical knowledge of dairying and other rural occupations. These classes could be addressed and examined from time to time by specially qualified instructors. [This is a very practical idea, and one that could be considered with much advantage by each of the Branches of the Agricultural Bureau.—GEN. SEC.]

Port Elliot, December 15.

Present—Messrs. J. McLeod (chair), J. Brown, W. E. Hargreaves, H. Green, sen., H. Pannell, H. Welch, R. E. Ulrich, C. Gosden, E. Hill (Hon. Sec.), and one visitor.

STANDARD SAMPLE OF WHEAT.—The Chairman undertook to obtain and forward to the Chamber of Commerce a sample of the wheat grown in the district.

IRRIGATION.—Mr. O. B. Hutchison sent the following paper on this subject:—

In our climate, in the great majority of situations, to be at all successful with certain summer crops, irrigation is a necessity; also the citrus tribe cannot be satisfactorily grown without a liberal supply of water, and doubtless, could the water be cheaply procured, many crops which now do moderately well without artificial watering would be benefited by a judicious use of irrigation. My remarks are intended to apply only to small holdings such as the average market gardener, fruitgrower, or the like might occupy. I do not intend to treat

in this paper so much of the proper times and the best methods of applying the water to the crop itself as of the means we have of conserving or raising the water and conveying it to the place where it is required for use.

The first and cheapest method, no doubt, is the case when the land is so situated that water from a stream or spring can be diverted and distributed in open channels; but comparatively few gardens are so situated, besides which there is some danger from winter floods if the land be sufficiently low-lying and near a stream to be irrigated in summer by this method. Another plan, though attended with considerable initial expense if it is intended to have sufficient water to last throughout the summer, is to conserve water in a suitable gully and convey it by pipes to the garden. Provided there is a good catchment area, and the dam is large enough and well made so that as little silt as possible will be carried into it, this plan would probably give the least trouble afterwards until the pipes required renewing, which in most places would not be for many years. There is, however, considerable loss by evaporation in an uncovered reservoir, and usually more or less leakage.

In the vast majority of cases I may safely say water required will have to be raised either from a well or stream, and in such cases it is necessary to consider the means we shall employ. A good windmill and pump is, I consider, the cheapest means, and there are few places where sufficient wind is not available; but with a windmill storage tanks are very desirable owing either to the wind often blowing at night when the distribution could not conveniently be attended to, or else there may be no wind for several days together. If the tanks be sufficiently elevated, and the water laid on with taps at convenient intervals, this method will be satisfactory. Another method of raising water, and a very excellent one, is by means of a hydraulic ram. It cannot, however, be used except where there is a sufficient head of running water to work it, but in nearly every creek or stream this can be managed by a little engineering. The ram will work with a head of only 18in., but very little water will be raised to any height, and it is desirable to get 4ft to 6ft. head. When fixed up the ram will work day and night for weeks or months together, occasionally stopping if a leaf or something gets into the valve. For this reason it is necessary to use a fine strainer on the supply pipe. I have used perforated zinc with a small ram such as I have had for a long time, and which requires from 7galls. to 14galls. per minute, according to the head; I have raised more than 1gall. per minute to a height of 20ft. This answers well for orange trees without storage tanks, as the water can be turned on for a few hours to each tree and soaks in nearly as fast as supplied. There must be hundreds of places in the colony where a ram could be put up and be a great convenience, not only for irrigation, but for domestic use, but I am not aware of more than a very few places where one is employed. The makers claim that water can be raised by this means as much as 500ft. The cost is not excessive, and wear and tear very little.

Another small motor which may be used for pumping is the hot air engine. These engines are comparatively cheap, and require only a little fuel and not much attention, and are commonly made of only a few man-power. I have had no personal experience of them. Horse-power has been employed for raising water, and would answer well with such an appliance as a water lift. When any considerable quantity of water is required it will be best to employ some sort of engine. Steam or oil engines are most in favor, and without doubt, where fuel is abundant, the steam engine would be the most economical; but it takes longer to get up steam than to start an oil engine, and a little attention is required for stoking. There is not much difference in the cost of a steam engine and boiler and an oil engine of equal power, and the latter requires very little attention when at work, can be started in a few minutes; but the oil bill would mount up in a season, even at the price of a penny per horsepower per hour. Another thing that must not be lost sight of, if it is decided to procure an engine, is that it can be used for other purposes, such as chaff-cutting, wood-sawing, cream-separating, and the like.

After the engine has been decided upon the next thing is to procure a suitable pump. Where the lift is not very great I do not think anything can be better than a centrifugal pump. These throw an immense stream of water, and are the sort I should be inclined to adopt if 5,000galls. to 10,000galls. per hour were required.

Now, having considered various means of obtaining or raising water, I may say a few words on the means to be employed to convey it to the plants or trees that require it. In the case of a small supply, such as would be obtained with a windmill and tanks of 5,000galls. or 10,000galls. capacity, a main pipe of 1½in. or 2in., and branch pipes of 1in. or 1½in., would be about right. Water so laid on and under sufficient pressure enables one to use sprinklers which imitate rain about as closely as we can hope to do, and enable the leaves as well as the roots to get wetted; besides which, if the plants are well mulched and grown, say cucumbers, there is some difficulty in getting water evenly distributed over a large bed if it be applied at the roots; this is remedied by using the sprinkler. I understand that a considerable proportion of the water is taken up by the air when so applied; still, it is very convenient, and cooling the air may not be a disadvantage. In the use of a large pump the iron piping required would be very expensive, and might be replaced by glazed earthen pipes. These

are easy to lay, and, if the joints are cemented, will stand considerable pressure. They are almost everlasting, too. A 6in. pipe will carry a large stream, and can be procured from the makers at a less cost than the present price of 1½in. iron pipe. The freight on them is rather heavy, as it does not take a great length to weigh a ton. If properly arranged with a stream this size the distributing can be done by open channels.

It seems likely that the cost of an irrigation plant would, in many cases, be returned in a few seasons. The present spring may be instanced. We had about two months with very little rain. Were it possible at such a time to put 2in. or 3in. of water on a potato crop, for instance, just when it was wanted the yield would be increased to an astonishing extent. Caterpillars and grubs, which have proved so destructive, are not fond of water. It was probably the long spell of dry weather after the moths had laid their eggs which caused such an abundance of these insects; had the crop been irrigated, especially with a sprinkler, many of the eggs might have been washed away. I have found in the case of tomato plants, melons, &c., that since I applied water frequently they have suffered little from grubs and caterpillars. Grubs will be found buried near the roots of the plants during the day; a stream of water causes them to come out, and many are drowned or washed away.

I would advise all who possibly can to adopt some means by which they can water their summer crops of vegetables and the like. In the case of farmers and others, by the expenditure of a few pounds for extra piping and taps, much labor could be saved (that is, when once they had the water). For instance, a tap could be placed close to—or, if desired, inside—the house, others near the piggery, milking yard, &c., and thus all the labor of carrying water daily would be saved.

Koolunga, December 6.

Present—Messrs. T. B. Butcher (chair), J. Button, R. Palmer, E. J. Shipway, W. J. Jose, G. Cooper, J. Sandow, W. T. Cooper, R. H. Buchanan, R. Lawry, J. Butterfield, G. Pennyfield (Hon. Sec.), and one visitor.

EXPERIMENTAL PLOTS.—Judges reported that Mr. J. Button had been awarded first position for experimental plots.

BUNT.—Mr. Geo. Cooper said he had used the drill at last sowing, and now had more bunt in his crop than during the previous thirty years. Mr. Butcher said he believed the fertilisers were the cause of the bunt. [There is no foundation for that belief. Bunt is produced from a microscopic "seed" (called "spore"), of which many thousands exist in each bunt-ball. When that ball is broken in any way the seeds or spores are scattered amongst the wheat, and each one is capable of causing "bunt" on the wheat plant produced from the seed wheat.—GEN. SEC.] Mr. R. Palmer had drilled fifty acres without fertilisers and had no bunt, whilst close alongside he sowed out of the same lot of wheat with manures, and got a lot of bunt. Mr. Button and Mr. G. Pennyfield each sowed bunted wheat that had been pickled and got very little bunt, but similar wheat sown without pickling had quite 90 per cent. bunted.

Onetree Hill, December 7.

Present—Messrs. G. Bowman (chair), A. Adams, F. Barritt, F. Bowman, J. Flower, J. Hogarth, F. L. Ifould, A. E. Thomas, and J. Clucas (Hon. Sec.).

SEED REPORTS.—Mr. F. Bowman tabled a splendid onion grown from Bureau seed. Mr. Ifould reported very favorably of some carrots from seed obtained from the Bureau. [Would it not have been of some value to other members if the names of the varieties had been given?—GEN. SEC.]

WHEAT EXPERIMENTS.—Mr. Ifould found Silver King wheat, received from Central Bureau, unsuitable, as it did not appear to stand the hot weather. Mr. Flower had tested side by side sixteen varieties of wheat obtained from the Burra Branch. Some were good, and others absolute failures. Algerian grew to a height of 6ft., and the beard in such growth would not materially affect the chaff; it would yield equal to 5 tons of hay or 24bush. to 28bush. of wheat per

acre. He was afraid the variety might not prove satisfactory in a dry season, and it should only be grown on fallow land. Marshall's No. 3 wheat was generally spoken of as a good all-round variety; the heads were very good. Majestic was almost equal to it, while one member obtained fifty-nine bags from eleven acres sown with Gluyas Early wheat. Mr. Flower had grown Majestic and White Tuscan on fallow as well as on land not fallowed. On the fallow land the Majestic was the better, but on the other land the positions were reversed. Majestic was, however, earlier, and a splendid hay wheat. Mr. Hogarth obtained 30 bush. per acre last season from this variety, and but for takeall would have got an equally good return this year. Mr. Flower thought it would pay farmers better to purchase seed wheat from those who make it their business to grow improved varieties for seed, rather than for each one to attempt to raise seed wheat for himself, as in the former case actual results could be seen and a selection made from the crop.

MANURES.—Members did not think that the use of commercial fertilisers on limestone country would be profitable [This is, however, contrary to the experience throughout South Australia, as many of the most profitable returns from these fertilisers have been obtained on such land.—GEN. SEC.], but with judicious use of farmyard manure, the best results could be anticipated.

FEEDING OF LAMBS.—In view of the prospects of a demand for lambs, Mr. Barritt suggested feeding hay to the ewes in July, which met with the approval of the members. It was pointed out that chaff could be utilised for this purpose by making V-shaped troughs, which were easily constructed.

NOXIOUS WEEDS.—The necessity for enforcing the provisions of the Noxious Weeds Act was dealt with. The present was a good time to deal with the star thistle; it was not enough to cut up the plants, they should be gathered and burnt.

Lipson, December 1.

Present—Messrs. G. Provis (chair), E. H. Thorpe, Jas. Brown, H. Brown, J. McCallum, C. Provis, H. Brougham, J. Wishart, jun., R. B. Haldane (Hon. Sec.), and two visitors.

EXHIBITS.—Mr. C. Provis tabled very fine potato onions. Hon. Secretary showed Ranjit, Silver King, Marshall's Hybrid, and Majestic wheats grown from seed supplied by Central Bureau, drilled in with English super. alongside other wheat similarly treated. Steinwedel and Norman's Early were both very superior to the four others.

Golden Grove, December 13.

Present—Messrs. J. R. Smart (chair), F. G. McPharlin, J. Woodhead, R. Smith, J. Ross, W. Mountstephen, F. Buder, and J. R. Coles (Hon. Sec.).

OLD AND NEW SEED.—Mr. Buder said the report of his remarks on this matter at previous meeting did not convey the point he wished particularly to refer to. What he said was that seeds of running varieties of plants and also tomatoes should not be used before they were three years old. The reason was that plants from old seed did not throw out so many runners, fruited more quickly and in greater abundance than plants from new seed, which make a lot of runner growth at the expense of the fruit. The seed of cabbage, cauliflower, and similar plants should *not* be used after it is three years old, as new seed produces plants with vigorous leaf growth.

WHEAT EXPERIMENTS.—Mr. F. G. McPharlin tabled samples of Ranjit, Marshall's Hybrid, Silver King, and Majestic wheats, grown from Bureau seed. The general opinion is that none of these wheats is as good as White Tuscan, alongside of which they were grown. Mr. R. Smith tabled some fine specimens of Galland's Hybrid wheat, which is generally considered the best wheat for hay in this district. Messrs. Smith Bros. received a small sample lot of this wheat from the Central Bureau about eleven years ago, and since then it has adapted itself to almost any soil here. Members considered that it would do well in the southern parts of the colony. It should be planted about first week in May. It is a late wheat, bunt-proof, and nearly rust-proof. One year it yielded over 44bush. per acre, but the usual yield is 30bush. The beards fall off as it ripens. The grain is dark and rather flinty.

Pine Forest, December 4.

Present—Messrs. J. Phillis (chair), W. H. Jettner, W. Lewis, W. Kempster, W. C. Cooper, E. Masters, F. Masters (Hon. Sec.), and several visitors.

HOMESTEAD MEETING.—This meeting was held at the Chairman's residence at Wokurna. Mr. Phillis tabled several different wheats, including one raised by himself and called "Phillis's Marvel," a variety that has proved rust resistant and has done well in this district. Splendid samples of onions, cucumbers, and apricots were also tabled. The orchard was inspected, and great surprise expressed at the results obtained. Members were entertained by Mr. and Mrs. Phillis, and it was remarked that the majority of the articles of food on the table were grown and manufactured by the family.

CHANGE OF SEED.—This subject was well discussed. Mr. E. Masters was a strong advocate for a change every two or three years, and would favor seed from a moister district. Mr. Jettner preferred seed from a drier climate, holding that wheat produced in a dry district was more prolific and hardy when grown under better conditions. Mr. Kempster thought even a change from heavy to light soil beneficial. The Chairman urged the exercise of great care in obtaining change of seed, otherwise they might introduce noxious weeds to their farms. The Hon. Secretary said farmers were too careless in the matter of seed wheat, and now it was really difficult to get pure seed true to variety. Many farmers advocated a change every other year, but in his opinion there was more in selection of seed. Most of their wheats were degenerating through carelessness in the matter of changing, and neglect in the matter of selection. Take Steinwedel wheat; this was not the variety of ten years since, and would get even worse unless care was taken to raise the standard. He did not doubt that change of seed was sometimes desirable, but there would be less necessity for it if the farmer paid the attention he should to the selection of wheat for seed. Find the wheats suitable to the district and then improve them by selection.

TAKEALL.—Mr. Jettner read a short paper on this subject. His own crop was free from "takeall," while the neighbors' wheat was badly affected. Both crops were on similar land, not having been cropped for two years. The paddocks were ploughed and drilled wet, and yet the results were dissimilar. Professor Lowrie had stated that "takeall" was largely due to dry-working of the fallow, but this experience seemed to contradict this. There might, of course, be some difference between fallow land and land merely ploughed up at seeding time; and then, too, the different soil the Professor had to deal with might make the difference; here the soil was very light. He believed early fallow was not so liable to "takeall," and his experience was that stubble land fallowed was more subject to "takeall" than fallowed grass land. In regard to

"deadheads" which appear in the crop, and which some describe as "takeall," he thought some obscure disease or insects were the cause, as "takeall" affected the wheat before it headed. That there was some disease not exactly determined affecting their wheat crops was certain. [Probably the "deadheads" in wheat are caused by the "wheat-stem-killing fungus," referred to in another part of this issue.—GEN. SEC.] Mr. Cooper agreed as to results from stubble and grass land fallow, and believed that to overcome "takeall" they would have to resort to cropping only once in three years. He preferred two crops in succession to fallowing stubble land. The Hon. Secretary believed much of the so-called "takeall" was due to rootfall, owing to the land not being sufficiently consolidated.

IMPROVEMENT OF STOCK.—It was decided not to purchase a Jersey bull which had been offered to the Branch, members being of opinion that their cows were quite small enough. A bull of a larger breed was required to improve the size of the herds. Mr. Kempster advocated the purchase of a good stallion with a view of improving their draught stock. All of them were obliged to rear or buy horses, and they might just as well raise the best they could. A first-class entire would not only be of benefit to the district, but would also be a source of profit to the Branch. He would get as much information as he could and bring the matter forward again.

Renmark, December 13.

Present—Messrs. W. H. Waters (chair), F. S. Wyllic, H. Forde, F. Cole, R. Kelly, H. Swiney, and E. Taylor (Hon. Sec.).

MANURING OF FRUIT TREES.—Mr. Forde stated that he had had very satisfactory results from treatment of some sickly orange trees. He cut a trench at a fair distance from each tree and put in a dressing of superphosphate and stable manure. Mr. Waters' experience was similar, and he was of opinion that if growers were to manure their trees in this way they would find results much better than from broadcasting and ploughing under, and that the extra labor would be more than compensated for. The Hon. Secretary agreed.

ANNUAL REPORT.—During the year eleven meetings have been held and four papers and pamphlets read and discussed. The average attendance was only seven, and the Hon. Secretary regretted that their efforts to obtain a full membership of active workers had not been successful. The following officers were elected for ensuing year:—Chairman, Mr. E. Taylor; Vice-chairman, Mr. F. S. Wyllic; Hon. Secretary, Mr. H. Forde.

Stansbury, December 1.

Present—Messrs. A. Anderson (chair), P. Anderson, C. Faulkner, J. Sherriff, G. Jones, and P. Cornish (Hon. Sec.).

WHEAT EXPERIMENTS.—On occasion of previous meeting several members accepted an invitation from Mr. C. Faulkner to inspect his experimental plots and the crops of various kinds. Of the samples received this year from the Central Bureau, Majestic and Marshall's Hybrid wheats were considered well worthy of further trial. Ranjit was the poorest of the lot tried. Some Gluyas's Early and Petatz Surprise were also very good. A magnificent crop of malting barley occupied forty acres of land, and some King's Early wheat cut for hay had given a good return. King's Early left for grain was very promising, but Dart's Imperial and Marshall's No. 3 had been blighted in patches by the dry weather affecting what would otherwise have been good returns.

HARVEST PROSPECTS.—Members reported favorably on the crops in general. Some have started reaping and found their returns quite up to expectations. The barley and oat crops are also good, and the hay crop is considerably above the average.

CHANGE OF SEED.—This subject was discussed. Members have found an occasional change of seed wheat distinctly beneficial, but there has always been a difficulty in getting good clean seed true to name. It was suggested that change of seed might be managed through the various Branches if some member in each would undertake to select some of the best crops in their district for purchase for members of other Branches when harvested. It was thought that if some such scheme was adopted a change of seed might be managed with advantage to all. As the expenses in transit would be considerable, it was thought advisable to let the matter stand over for this year. [A similar scheme was suggested by the Pine Forest Branch, I believe, some five or six years ago, and for a time we published in the *Journal* an "Exchange of Seed Wheat" column, but the matter was not followed up by those interested. Undoubtedly the difficulty of obtaining clean seed true to name, when a change was desired, could be overcome by the adoption of the idea referred to.—GEN. SEC.]

BAGS AS WHEAT.—This matter was again discussed. Mr. P. Anderson pointed out that the farmer who purchased 1,000 bags had to lay out £25, and on selling the wheat, "bags in," at present prices he was only allowed £6 5s., so that he lost £18 15s. on every 1,000 bags; not only so, but if the bags were mended in any way, or discolored, the farmer was docked 2d. per bag. It was resolved that the members endeavor to bring about some alteration for the better in the system, which at present is very hard upon the farmer.

STANDARD SAMPLE OF WHEAT.—Members thought the fixing of the standard bushel so high is detrimental to the farmer whose wheat is somewhat pinched, and, not being quite up to the standard, is docked by the buyer. As the farmer who brings in wheat above the standard does not receive any higher price per bushel, no inducement was offered to the farmers generally to clean or otherwise improve their samples.

Wilson, December 8.

Present—Messrs. W. H. Neal (chair), T. Barnes, T. Matthews, H. Ward, and A. Canning (Hon. Sec.).

ECONOMY OF LABOR ON THE FARM.—Paper on this subject, as read at Congress, was well discussed. Most members agreed that many of Mr. Dall's recommendations could not be fully carried out in this district, on account of the dryness at seed time, and as a rule it was absolutely necessary to spell the horses after seeding. All were agreed that more might be done in the preservation of feed, and the care of it after it has been saved. It was also agreed that there was much room for care in the selection of seed.

HORSE-BREEDING.—Congress paper on this subject by Mr. Hawke was also discussed, and all agreed that it was full of good points. Most members were of opinion that fairly well-bred medium heavy horses were best for farm work as they got over the ground so much easier and quicker than heavy horses. Heavy active draught stock were, however, the best to breed for sale, with perhaps the exception of good ponies.

RABBITS.—Members were of opinion that something should be done to compel the destruction of rabbits by all landowners. Most members were of opinion that the only way to protect the crops was to wire-net off the outside country to prevent the incursion of rabbits from the large areas upon which they were allowed to breed unchecked. The rabbits have been a terrible scourge this year; but for their ravages everybody would have at least reaped seed or more.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

December 27, 1900.

A continuance of dry cool weather for time of year has permitted harvesting operations to be carried out under unusually favorable conditions. Although the high expectations of some farmers early in the season are not being quite realised, where they have cleaned up the yield is generally proving better than estimated a month ago. A fair quantity of hay has been saved, and about two-thirds of the wheat crop reaped. A slight recovery in the price of wool, and fair feed prospects generally, makes the outlook in the country show improvement. Supplies of water are mostly adequate, but to carry through the summer and to freshen up feed a good 2in. rain would be of immense benefit, though it might possibly damage some of the later grain crops.

In commercial circles there is satisfaction generally expressed at the result of the year's operations. Country trade could easily show a greater volume, but there has been such an absence of the financial stress that often accompanies seasons of more activity that merchants and storekeepers in most districts, as well as the city houses, by their refraining from grumbling indicate that in trade things are fairly good. In mining matters there is extreme dullness shown on the share market, but steady development continues, particularly in the opening out and raising of copper ore. Further discoveries at a depth are reported from the Tarcoola Goldfield, but, considering the number of men there, nothing very encouraging just now is being shown.

In breadstuffs a rather uneventful month has been passed. London values are about 1s. a quarter lower, but as freights from these colonies are more easily obtainable at a reduction of about 5s. a ton, wheat locally is slightly higher than when quoted a month ago. The dullness reported in European markets is attributed to anxiety on the part chiefly of Californian holders to reduce their stocks, which have been accumulating during the past couple of seasons, and are known to be fairly heavy. Business in the local market has been practically suspended since before the holidays, but quotations are not expected to display much variation when the market again re-opens in the new year. In forage lines trade is slow. An Imperial Government order for 3,000 tons of hay has been submitted in this colony, but as oats is stipulated and most of the hay raised here is wheaten (by the way considered superior in many buying markets) the order is not likely to benefit much our producers, though 10,000 tons of wheaten of prime quality could readily be supplied. The value of hay and chaff is unaltered. Feeding grains are a bit lower in price.

In potatoes demand is being fed from local sources, but as crops are digging very light high prices rule; a good rain soon would materially increase the later sorts. Onions are fairly plentiful; silver earlies have been exhausted, but brown skins are now reaching market freely.

The usual Christmas month's demand for dairy produce was again strongly in evidence, big catalogues being disposed of at each of the auction sales during December. European advices indicated a weakening in their butter market, but here, in consequence of the continued dry weather which further accentuated the steadily diminishing flow of milk, the price of butter rapidly advanced, exportation ceased, and unless good rains fall soon supplies will have to be augmented by importation, but in face of the wide margin existing between rates ruling in Victoria and here, our present quotations are not likely to sustain, though a heavy drop need not be reckoned on. Lower grades are especially dear in proportion to better sorts. During the first week in the month eggs continued to firm up in value, but as orders intended to supply the Christmas trade in West Australia became filled a dullness set in, quotations receded to about bottom value for the season, and a glut is reported from the western colony. As this eases off, however, a return to higher rates may be early expected. In both cheese and bacon heavy demand has been met without any alteration in values. Hams have been in great request, but are uncommonly scarce. Honey during the month has been exceptionally dull. All almonds marketed at good prices, but the Christmas trade being supplied, manufacturers are holding off for new crop.

The supply of poultry has been very heavy at all the sales since last we reported, but demand steadily strengthened so that prices realised continued to improve on even previous high rates, and again we would urge especially the small producers to bestow increasing attention on this industry, which promises to be one that will well repay them for their outlay. A vast export trade exists which has practically never been tapped from this colony.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide, 2s. 8½d.; outports, 2s. 8d. per bushel of 60lbs.

Flour.—City brands, £6 5s. to £6 7s. 6d.; country, £5 17s. 6d. to £6 2s. 6d. per ton of 2,000lbs.

Bran.—9½d.; pollard, 10d. to 10½d. per bushel of 20lbs.

Oats.—Local Algerian, 1s. 8d. to 1s. 10d.; ordinary stout feeding at 2s. to 2s. 6d. per bushel of 40lbs.

Barley. - Malting, 3s. to 3s. 9d. ; Cape, 2s. per bushel of 50lbs.

Chaff.—£2 10s. to £2 15s. per ton of 2,240lbs., dumped, f.o.b., Port Adelaide.

Potatoes.—New locals, £7 10s. to £8 per 2,240lbs.

Onions.—New season's, £3 to £3 10s. per 2,240lbs.

Butter.—Creamery and factory prints, 11½d. to 14d. ; bulk, 9½d. to 10½d. ; dairy and collectors', 7½d. to 9½d. per pound.

Cheese.—S.A. factory, 6d. to 8½d. for best matured ; good new, 5d. to 5½d. per pound.

Bacon.—Factory-cured sides, 5½d. to 6½d. ; nice farm lots, to 5d½. per pound.

Hams.—S.A. factory, 8d. to 9½d. per pound.

Eggs —Loose, 5½d. ; in casks, f.o.b., 7d. per dozen.

Lard.—In bladders, 5d. ; tins, 4d. per pound

Honey.—2d. for best extracted, in 60lb. tins ; beeswax, 1s. 2d. per pound.

Almonds.—Soft shells, 4½d. to 5½d. ; kernels, 1s. per pound.

Gum.—Best clear wattle, 2d. per pound.

Live Poultry.—Good table roosters, 1s. 8d. to 2s. 2d. ; fair cockerels and good hens, 1s. 8d. to 1s. 6d. ; a few coups of small and poor conditioned birds, 1s. to 1s. 2d. ; heavy weight ducks, 2s. to 2s. 9d. ; ordinary sorts, 1s. 5d. to 1s. 10d. ; geese, from 3s. 3d. up to 5s., according to size and condition ; pigeons, 9½d. ; turkeys, from 8d. to 9½d. per pound, live weight.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.



Journal of Agriculture

AND

Industry.

No. 7. REGISTERED AS FEBRUARY, 1901. [A NEWSPAPER. VOL. IV.

NOTES AND COMMENTS.

It is reported that the British army authorities refuse to entertain the idea of using Australian wheaten hay for horses in the service on account of it appearing like straw. It should be remarked that our Australian horses are fed upon hay raised in Australia, and that the animals proved to be much more hardy and reliable than those that went from Great Britain to Cape Colony and the Transvaal and Orange States. Our pure clear sunlight rapidly takes the green color out of hay, but the nutritive quality is probably much greater than that of hay made in colder and moister climates, where clouds prevail and sunlight is rare. Most of our horseowners prefer wheaten to other hay.

The value of rabbits exported last year from New South Wales in the freezing chambers of the ocean steamers was £333,000, whilst the mutton sent off in the same way was valued at £260,000.

Under federation Australia should be in a position to assert herself in the European markets with regard to her mutton, butter, and honey, and see to it that these articles are sold to consumers on their merits, and under a proper understanding with respect to their origin. It is said to be an almost universal practice with dealers to run down the merits of such Australian products, but to sell the same articles under famous European names. It would be a strange thing to find a strong flavor and odor of eucalyptus oil in honey in Australia, but in Great Britain it is the common complaint, except when the same honey is sold as "genuine Narbonne."

There is no cause whatever for anxiety concerning the effect upon the world's wheat market in connection with the appearance of the comparatively harmless "wheat-stem-killing" fungus. It kills the plant before it can reach maturity, and therefore no wheat can be exported as the produce of such diseased wheat plants. It is most probable that the disease has existed for many years in Australia, and has been one of the many forms of "takeall." It is true that in some cases a considerable area of wheat crop may be ruined by this variety of "takeall," but since it kills the plant before the seed can be produced the market for South Australian wheat cannot be "disastrously affected" as one or two persons are said to have feared.

The New South Wales Government Statistician has issued his final estimate of the wheat harvest for 1900-1. He places the area saved for grain at 1,357,643 acres as compared with 1,426,166 acres the previous season. The average yield is, however, put down as 12·6 bush. compared with 9·5 bush. the previous year. The total yield is over seventeen millions of bushels, an increase of over three and a half millions over the 1899-1900 return. It is estimated that New South Wales will have six and a half million bushels available for export. The area cut for hay is put down as 553,896 acres.

The Hessian fly was found in New Zealand about fifteen years ago, and South Australian farmers should be very thankful that up to the present the pest has not yet been introduced in straw packages or with seed wheat. The destruction of wheat crops in America when *Cecidomya destructor* (Hessian fly) was first introduced was disastrous in the extreme. It is said that his satanic majesty's strongest weapon is a sneer, but the writer is prepared to bear as much ridicule as reckless people can heap upon him provided he can induce importers of seed wheat and others to take every reasonable precaution against the introduction of this abominable and fearfully destructive insect. Ridicule prevented anything being done to prevent introduction of codlin moth. Let us be vigilant in keeping Hessian fly at a distance.

The result of experiments conducted at the Agricultural Experiment Station, Nebraska, U.S.A., have again proved that shallow cultivation amongst growing crops is more beneficial than deep stirring. The climate of that district is dry and hot in summer and autumn, and the shallow loosening and pulverisation of the soil prevents capillary attraction of moisture to the surface, allows of sufficient aeration, and tends to keep the subsoil moderately cool.

There have been too many deaths of cattle after eating young growths of sorghum to allow of any doubt that, under circumstances at present unknown, this plant is sometimes poisonous. It does not always cause tympanitis or "bloat," or "hoven," because the cattle die without any swelling in many cases. Neither is the toxic effect always due to some kind of poison in the joints of the stems, because cattle have died after eating plants which had not yet developed stems. The only safe plan is to keep stock away from sorghum until it begins to ripen its seed, and never to turn them on to a crop whilst they are ravenously hungry. Sorghums are far too valuable as fodder crops to be dispensed with, and with ordinary precautions they are quite as safe, if not more safe, than clovers, &c.

In Colorado, U.S.A., last season there was a great glut of cantaloupes (sweet melons), and a farmer says he fed them to his cows with extraordinary results. The cows fattened rapidly, and at the same time gave a great increase of much richer milk than before. The statement is to be officially investigated.

The botfly (*Gastrophilus equii*) has "come to stay" with us, but its power for mischief can be controlled to some extent. The nits or eggs of the fly are deposited on the hair of the horse in positions which can be reached by the lips or tongue. They appear to have an irritating effect, which compels the horse to remove them by licking or biting. From the mouth of the animal the eggs reach the stomach, where the maggots, or "bots," are hatched. By means of hooks about the mouth parts the bots hang on to the lining of the stomach for a considerable time, finally being voided in the dung, when the maggots enter the soil and then emerge as perfect flies. The preventive means to be adopted are very frequent brushing and currycombing, washing with carbolic soap, and use of a little kerosine on the brushes.

The seeds of various sorghums will soon begin to ripen. For resowing next season great care should be taken in selecting the best seed from the best plants, because the variety will soon deteriorate and become unprofitable unless this is done. Good seed and good fodder can be secured from the same plant if the seed is taken when it is just barely ripe. The weight, size, shape, and character of each seed-head should be considered when selecting seed for sowing. For feeding purposes an acre of sorghum is often far more valuable than an acre of maize, but a bushel of maize has a greater nutritive value than a bushel of kaffir corn (or sorghum seed). Sorghum grows most rapidly when the temperature is high.

Unlike many other pests, the so-called San Jose scale (*Aspidiotus perniciosus*) does not confine its attacks to one class of plants, and whatever plant it does attack will be ultimately killed by the multitude of scales. For this reason the most heroic and stringent measures are justifiable in dealing with the San Jose scale when first discovered in any orchard or garden, as well as in endeavoring to prevent its introduction with nursery stock or otherwise. It may prove a little bit hard upon the orchardist or gardener to have every infected plant dug up or destroyed, and the importer of plants may strongly object to inspection, fumigation (even destruction in some cases) of his introduced plants, as well as to the fees he may have to pay for such work, but in the interests of himself, as well as of every grower of plants, it is a sound and essential policy to enter upon such precautions at once.

It has been asserted, with much probability of truth, that tar water will kill the woolly aphis affecting the roots of apple trees. If coal tar is thinned down considerably with kerosine it will mix the more readily with boiling water in which a little washing soda has been dissolved. Take, say, 5galls. of water, dissolve 2lbs. of soda in it; then, whilst boiling, slowly add 24ozs. coal tar that has been mixed with a quart of kerosene, stirring rapidly all the time. Then mix 1gall. of this slack solution with 25galls. water, and apply either at the roots of the trees or as a spray upon the branches where affected. Try this experiment only at first—not wholesale.

A spraying machine for extinction of grass fires has been invented by Mr. Hay-Fowler, of Bringagee, N.S.W. It is simply a 100-gallon tank mounted on wheels and fitted with a force pump and spray nozzle, and has proved very effective. Two men and a boy to drive are sufficient to work the affair, and provision is made for the carriage of buckets to fill the tank from reservoirs.

Angora goats are reported by Mr. E. A. Scammell, of Adelaide, to have done very well on his station at Blanchetown, on the Murray river. He has some of the valuable pure bred goats from the sale of the late Mr. Price Maurice, Castamboul Estate. Mr. T. Dodd also has some very good Angoras, but the locality at Mundoo Island is not too well suited to their requirements.

When opportunities occur and seasons are favorable farmers begin to think of their obligations to their benefactors. There is one man amongst them who has done much in an unostentatious way for their benefit, and he should not be forgotten. Mr. A. Steinwedel was the originator of the wheat bearing his name, and he produced it by cross-fertilisation with Golden Crown (known here as Early Baart). Although this variety has its faults it has proved on the whole to be a most valuable and prolific wheat, and Mr. Steinwedel richly deserves the gratitude of his fellow farmers.

LIVE STOCK NOTES.

By C. J. VALENTINE, CHIEF INSPECTOR OF STOCK AND BRANDS.

The quarterly reports of the inspectors continue to show the importance of inspection. One hundred and forty cattle were found infected with tuberculosis, of which 120 were destroyed and twenty isolated for further inspection. A moderate percentage of these were milch cows. Six pigs were destroyed, also affected with tuberculosis, caused no doubt from being fed on affected milk.

Nine cattle were destroyed affected with actinomycosis, being wasters, and three isolated; and twelve cattle were condemned for cancer.

There were 139 reports of stock being diseased, but in most of the cases the animals were suffering from local ailments — impaction, rickets, asthenic apoplexy. Losses of cattle and sheep were reported from eating *Lotus australis*, *Euphorbia Drummondii*, weeds, bad food, &c. Three hundred and fifty sheep died, and a number suffered from ophthalmia. Dressings of tincture of opium and water and alum and water were found effective. Seventy-five deaths of cattle from impaction and rickets were noted, but the general loss from these causes has been very much heavier. The most successful treatment for cattle with these ailments is a plentiful supply of common salt, sulphate of iron, and bonemeal, given in food and well mixed and kept in troughs for the animals to lick. For the information of owners I would point out that where the lands are manured with phosphatic manure the animals are anxious to feed there, and these local ailments disappear. The effect of the past year's inspection of cattle at the markets and in the travelling droves has reduced the number of diseased stock brought forward very materially. Owners find it unprofitable to send diseased animals to market, and have evidently destroyed them. The small percentage of diseased animals destroyed at the abattoirs is very low, and the evidence of animals having been affected and recovered is very small compared with what was the case some years since.

A few cases of deaths of horses from local causes have been noted, but no contagious disease.

No serious losses have been noted from worms in sheep. Tick and lice have not been prevalent in the Northern District, and no special action has been necessary, but in the Southern District the parasites are very prevalent in the flocks through the negligence of the owners, many of whom delay dipping

because their neighbors are not compelled to dip. Although the regulations have been in force for some years there are still numerous sheep-owners who evade dipping, and justify themselves by complaining of their neighbors. One hundred and fifty notices to dip sheep have been issued. Promises have been made to erect four or five dips, and I trust the inspectors will not be obliged to prosecute persons for having sheep affected with tick. In the South-East District only in a few flocks have the parasites been found at all plentiful, and in many cases the flocks are quite free by the continued care taken in dipping.

Three informations were laid: one under the Brands Acts for cropping the ears of young sheep by a straight cut, for which serious offence only a nominal fine was inflicted. Two very gross cases occurred under the Stock Regulations: one for removing diseased animals from quarantine, and one for exposing diseased animals for sale in a public market, thus endeavoring to sell diseased meat for human consumption. The local magistrates evidently do not recognise the importance of preventing diseased meat being sold, or the necessity of preventing owners from breaking quarantine, with evil consequences to other stockowners, the fines inflicted being of such a nominal amount as in no way sufficient to deter owners from committing breaches of the law and frustrating the endeavors of the inspectors to protect the clean herds.

DAIRY BULLS FOR BRANCH BUREAUS.

A few months since the Hon. Minister of Education and Agriculture, on the recommendation of the Central Bureau, decided that the department would assist any Branch of the Bureau desirous of obtaining pure-bred bulls of approved strains for the purpose of improving the dairy herds of their respective districts. The conditions under which the Branches will be assisted are—(1) Bulls to be purchased subject to the approval of some person representing the Department of Agriculture; (2) bulls purchased with the assistance of the department to be available for reasonable use by the public at a fee of not exceeding 5s. for each service, preference to be given to pure-bred cows and good milkers; (3) bulls purchased not to be removed from the district, or disposed of without the consent of the Minister of Agriculture for a period of three years from date of purchase; (4) records to be kept of cows served and results of service, and reports to be furnished half-yearly to the Central Agricultural Bureau; (5) the subsidy granted will be £1 for £1, up to £12 10s. raised by the Branch.

Under these conditions there have been five bulls purchased during the past six months by the Branches. Woodside and Millicent have purchased well-bred Holstein bulls from Mr. J. W. Porter's well-known herd. Dawson and Finnis have purchased Jerseys from the department, and Wilmington has purchased a Shorthorn bull from a good milking strain. Two other Branches have decided to purchase, and several have the matter under consideration. The department has twelve Jerseys, five Ayrshires, and one Holstein bulls available for purchase by the Branches at prices varying according to age and breeding from £14 to £20. Under the subsidy conditions the actual cost to the Branches would be one-half of these amounts. The department pays rail carriage on any bulls purchased under these conditions.

If the bulls are not sold in the meantime the department will have available for loan to Branches under the usual conditions eight Jersey and two Ayrshire bulls. The bulls will be transferred from their present stations about the end of March. Applications for loan of same should be made to the General Secretary, Agricultural Bureau.

STATE HORSE-BREEDING.

It is not alone in Germany that the importance of improving the breed of every class of horse is recognised by the State or Government. Possibly a good deal of this anxiety arises from a desire to acquire control of superior equine stock for all sorts of military requirements, but in the effort to attain this end the horses are improved all along the line. For instance, the Melbourne *Leader* of January 12 prints the following concerning France:—"The whole enormous system is under the charge of one Government supervisor. M. Planzon, the general manager of the Government breeding establishments in France, states, in his last annual report to the Minister of Agriculture, that the total number of stallions in his twenty-two dépôts has, in compliance with recent legislation, been raised to 3,000, the actual number now in the different dépôts being 3,038, of which 262 are thoroughbreds, 365 Arabs, pure and crossed with the thoroughbred, 1,548 Normans, 261 Bretons, 71 Norfolk trotters, and 251 other half-breds, while 278 are Percherons, 61 Boulonnais, 54 Ardennais, and 51 other heavy draught breeds. These stallions covered in the past year 170,155 mares, of which 3,017 were thoroughbreds or Arabs, 103,045 half-breds, and 64,093 heavy draught breeds. In addition, 1,334 stallions belonging to private owners have received nearly £27,000 in premiums, and have covered 67,141 mares; while 187 stallions have been given a certificate of soundness, and have covered 8,740 mares, so that altogether 246,036 mares have been covered by stallions with a guarantee of soundness. Out of the 732 owners of approved stallions, 478 owned only one, 149 two, 63 three, and 25 four, while only one owner had as many as seventeen. Altogether, including the amount given in prizes, there is a total of £647,000 being spent annually upon the encouragement of horse-breeding, out of which £93,000 is contributed by the State."

AERATION OF MILK.

Experiments Conducted at Murrumbidgee Cheese Factory.

BY J. D. DAVIDSON.

In order to demonstrate to milk suppliers and others the beneficial effects of the aeration of milk directly after milking I have, during the present season, conducted a number of practical experiments with that end in view. People as a rule are averse to adopt a custom before they have had ample proof of its beneficial effects. An alteration in the manner of keeping milk which will materially increase the quantity and improve the quality of a whole factory's supply of milk cannot but commend itself to the favorable consideration of milk suppliers and factory proprietors alike. It is within the mark to say that by a thorough system of aeration and cooling by suppliers the milk received at the average factory would be enhanced in quality nearly 50 per cent., and the supply for a season increased several thousands of gallons. In almost every dairying district thousands of gallons of Sunday's and Saturday night's milk are fed to pigs or made into butter and sold for actually half the money that would be received were it kept sweet and delivered to the local factory. As a result of aeration, cooling, and rigorous cleanliness of milk utensils which was recommended in this district, I find, from comparative figures, that 5,000 odd gallons of Sunday's and Saturday night's milk have been delivered to the Murrumbidgee factory from September 1 to December 31 (four months), milk

which formerly would have been fed to pigs or calves or converted into cheap butter. Previous to this no milk more than twelve hours old was received for cheese-making, except during the three winter months, while on several occasions during November and December I have received Saturday evening's aerated milk on Monday morning, containing a sufficiently low percentage of acid (0.24) to pass for cheese-making, and on all occasions cheese made from such milk was first class. Some may look askance at this statement, but milk containing 0.28 of acid can be received with safety provided the bulk is sweet.

By aeration, &c., and a due regard for cleanliness my milk suppliers' cheques have been considerably swollen; besides, the profits of the factory are increased by the manipulation of a large quantity of milk which otherwise would have been next to wasted.

The appended results of experiments, which were carefully carried out, I have submitted for the benefit of the industry at the request of the Dairy Instructor (Mr. G. S. Thomson). The aerator used is one by which pure air is forced through the milk while in an ordinary milkcan, the milk by its action receiving simultaneous agitation while the air is forced through the milk, thus driving out all smells and gases. For determining the percentages of acid in the samples of milk treated the acidity apparatus was used—an instrument I can speak in superlative terms of as a correct indicator of the acid condition of milk, curd, and cream: first, in finding the true condition of doubtful milk at the weighcan; second, the condition of milk before renneting; third, acid in curd at salting; fourth, in butter-making, the proper stage of cream ripening before churning.

To the cheesemaker who aims at uniformity in his product the acidity apparatus is as important as the mariner's compass is to the sailor or the field glass to the army scout. It must be borne in mind that the aeration of milk accomplishes two objects, viz., retarding the development of lactic acid, and the expelling animal odors and odors produced by bad water, rank pasture, and other agents. By the aid of a scientific instrument the exact percentage of acid has been arrived at in the aerated milk. Formerly to ascertain the second object in the absence of means for bacteriological examination, the sense of smell and taste had to determine the presence or absence of good or bad smells, flavors, or progress of germs of evil ferments. However, the following tables will show the good effects of aeration and cooling:—

Experiment I.

Equal quantities of night's milk were measured into two cans; after milking one was aerated and the other left as drawn.

Date and Hour.	Aerated Milk.			Unaerated Milk.	
	Temperature before Aeration.	Temperature after Aeration.	Per cent Acid.	Temperature.	Per cent Acid.
November 16, 6.30 p.m...	88°	83°	0.20	86°	0.245

The test for acid was made at 6.30 on the following morning. The conditions were similar, though the unaerated milk had the advantage of being two degrees lower at the time of the operation. The aerated milk was infinitely superior in taste, being free of odors. The unaerated milk possessed a distinct "cowy" odor and a flavor of dandelion. In addition to being wholesome in flavor, the aerated milk showed 0.045 less acid than the unaerated milk.

Experiment II.

Three cans of milk were treated in this test on November 26.

1 can, 15galls., aerated Sunday morning showed 0.21 acid on Monday morning.

1 can, 8galls., cooled and aerated Sunday evening showed 0.19 acid on Monday morning.

1 can, 8galls., cooled only Sunday evening showed 0.23 acid on Monday morning.

It will be seen that the milk which was aerated only and stood thirty-six hours (twelve hours during heat of daytime) contained 0.02 less acid than the milk which was cooled to 65° and stood for twelve hours only.

The absence of evil flavors in the aerated cans was again distinctly noticeable. This was testified by several persons who were unaware of the distinctive treatment.

Experiment III.

December 4.—Four equal quantities were treated immediately after milking and tested twelve hours later or the following morning.

Description.	Temperature before Aeration.	Temperature after Aeration.	Per cent. Acid.	Condition.	Time Coagulating.
1 can, aerated and cooled	94°	74°	.19	Sweet, good flavor	40 hours
1 can, cooled only	93°	74°	.22	Sweet, with weedy flavor	37 "
1 can, as milked	93°	—	.255	Rank smell	28 "
1 can, aerated only	94°	89°	.215	Sweet, flavor fair	38½ "

Several other experiments have been carried out, and all have shown in a marked degree the effect of aeration in driving off odors of all kinds common to milk. In conducting the above tests I have visited several dairy farms, and in all cases personally supervised the work in order to ensure exactitude in every instance.

MILK-TESTING AT FACTORIES.

By G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

The value of the acidity apparatus for testing milk has become recognised, and is being universally adopted for cheese-making. In recent articles it has been pointed out that acid determinations ought to be taken when milk is purchased, and under no circumstances should milk be accepted at a factory when the reading has exceeded a certain standard. I have examined samples of milk at factories, and on more than one occasion the acid has been as high as 0.31, while 0.28 was not uncommon. Such a percentage as the former is certainly excessive, and milk with that degree of acidity is very seldom without a "taint" which is destructive to the manufacture of sound and marketable cheese. Not alone are the losses confined to cheese-making, but in the process of milk separation for butter-making there is a heavy penalty. Let us consider how this may occur. When milk is received at a factory it is usually run into a vat and mixed with other supplies. It is afterwards heated to a temperature rarely lower than 85° F. in cool weather. The question is, how does this sudden heating affect the milk constituents? Heating is certainly beneficial to sweet milk, as the fat globules are liberated from their clustered condition, and are more perfectly removed from the milk; but, on the other hand, if acid milk is present the heating will certainly bring about a coagulating effect and render

efficient separation impossible, as the fat is retarded in its escape from the heavier solids and passes out as cream with the skim milk. Unfortunately these vital considerations are very often overlooked, with a natural consequence that the butterfat losses and the low prices from produce manufactured from sour and tainted milk cause severe blows to factories, and keep them in a continual state of struggle.

A Growing Evil.

The purchase of sour milk is becoming less restricted in some districts, a most serious matter arising from jealousy, which has sprung up amongst factories with a view to increase the number of their suppliers. One factory may rigidly enforce measures towards keeping up the standard of quality of their manufactured products, by buying only sweet and wholesome milk, while another neighboring factory is striving, regardless of reputation, to add to their number of patrons by accepting milk in a deteriorated condition. As an instance of this, the following percentages of acid in milk rejected by the manager of one factory, viz., 0.35, 0.33, 0.27, 0.44, 0.30, 0.33, 0.39, 0.42, 0.34, may be quoted, yet the same milk would doubtless have been accepted at another factory. What follows this stupid and suicidal system? It is not gain, but heavy loss to the factory participating in the practice, and injury to surrounding factories by a falling off in their milk returns. Not only does this happen, but actual encouragement is afforded to suppliers to become less careful in the treatment of milk, and, instead of the factory extending its sphere of usefulness to a district, and being of educational value to suppliers, it becomes a source of extended evil to the whole dairying industry. The same may be said with regard to the purchase of cream throughout the State. To mend matters, let factories unite and only purchase milk that has a percentage of acid below a fixed standard, and, if this were done, the quality of both butter and cheese would be improved, the demand keener, and the returns to manufacturers more remunerative. Barriers should be placed upon cream in a somewhat similar manner, and districts encouraged to support their own factories. To illustrate the acidity in milk received at a factory from six suppliers, the following is given :—

Percentages of Acid.

Supplier.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
1.....	0.22	0.21	0.20	0.19	0.19	0.19
2.....	0.25	0.23	0.21	0.24	0.23	0.20
3.....	0.19	0.20	0.19	0.18	0.19	0.20
4.....	0.27	0.23	0.25	0.23	0.24	0.21
5.....	0.23	0.22	0.25	0.23	0.21	0.21
6.....	0.20	0.19	0.20	0.18	0.19	0.19

The above table gives the result of one week's testing, which was done in comparatively cool weather, otherwise a number of cans would have registered "acid" readings. Those using the acidity apparatus know that sweet, fresh milk should not have more than 0.19 per cent. of acid; but the foregoing table shows much higher percentages. Nos. 1, 3, and 6 are very desirable, care having been taken in the treatment of the milk, while Nos. 2, 4, and 5 clearly demonstrate want of attention on the part of suppliers.

It will be noticeable to the reader that the Monday morning's milk, with few exceptions, records the highest acidity tests, an occurrence no doubt due to Sunday's milk being included in the supplies.

It may be mentioned that the tests given were taken from the milk after mixing. The supplies in each case were small.

How to Keep Milk Sweet and Cool.

This is the most interesting question to the factory manager, and one which has been discussed but very little. To my knowledge not a great deal has been published to illustrate the efficiency of any particular method of cooling.

Aeration has been much talked of and has been very strongly recommended by all authorities on dairying, as the benefits to be obtained are unquestionably great.

To send milk sweet and cool to the factories once a day in hot summer weather requires a little more than the filling of the cans direct from the cow evening and morning. The dairy farmer must bestir himself, and employ a simple yet effective means to keep the temperature of the milk down and prevent the formation of acid. With this purpose in view a long series of experiments has been made on the following lines.

At one of the factories three suppliers were selected to send daily three 10-gallon cans of milk, and those chosen were from nine to thirteen miles distant. The instructions given to the suppliers were to cover two of the cans with calico, leaving the third uncovered. At the close of each evening's milking 5galls. of milk was to be put into each can, but one must have the cover saturated with water, placing the cans under similar conditions until morning, when the remaining 5galls. were to be added, and additional water poured over the same cover, the other two remaining as before.

On arrival at the factory the first day of the test (Monday) the nine cans registered the following percentages of acid:—

	Wet Cover.	Dry Cover.	Without Cover.
First farm.....	·20	·22	·23
Second farm....	·21	·23	·22
Third farm	·20	·22	·23

On Tuesday morning the acidity went down—

	Wet Cover.	Dry Cover.	Without Cover.
First farm.....	·18	·21	·21
Second farm....	·19	·23	·20
Third farm	·18	·20	·22

Temperature of Milk Monday Morning.

	Wet Cover.	Dry Cover.	Without Cover.
First farm	76° F.	82° F.	81° F.
Second farm....	72° F.	80° F.	79° F.
Third farm	74° F.	78° F.	83° F.

Tuesday Morning.

	Wet Cover.	Dry Cover.	Without Cover.
First farm.....	66° F.	73° F.	74° F.
Second farm....	71° F.	74° F.	73° F.
Third farm	61° F.	69° F.	79° F.

Up to this stage of the test a couple of hot days set in, and at the close the acidity of the milk and temperature showed a marked variation.

	Wet Cover.	Dry Cover.	Without Cover.
First farm.....	·20	·23	·22
Second farm....	·20	·22	·24
Third farm	·19	·25	·25

Temperature.

	Wet Cover.	Dry Cover.	Without Cover.
First farm.....	77° F.	84° F.	86° F.
Second farm....	78° F.	88° F.	87° F.
Third farm	76° F.	85° F.	86° F.

In proof of the profits to be gained by covering cans with calico and wetting same, the following letter was obtained from one of the factory managers:—

ACID-TESTING OF MILK SUPPLIES

Experiment with Four Supplies of Milk, Two Distant and Two Near to Factory.

At the request of Mr. G. S. Thomson, Dairy Instructor, I carried out an experiment on three supplies of milk at the Murrumbidgee factory with the acidity apparatus for the purpose of determining the effect of cooling and cleanliness in preventing the development of acid in milk. The four supplies were tested daily for a space of three weeks during November. Whenever a high acid reading was found on a supplier's milk, instructions were given to thoroughly cleanse and sterilise cans and utensils and properly cool down milk immediately it was drawn.

In conducting the test with the three cans the milk in the can covered with wet calico had one to three points less acid, and the temperature, which was taken each morning, was from one to four degrees lower in the covered can; *the greatest difference in temperature prevailed when the weather was warm and sun hot.* One supplier aerated a can in addition to cooling, when the percentage of acid was surprisingly low.

An experiment tried apart from the above, with wet cover on an exceedingly hot morning, proved that by evaporation and protection from the sun—afforded by wet cover—kept a can of milk 10° cooler than uncovered milk during a journey of two and a half miles.

The results of these experiments have been so satisfactory that I now have the wet envelope system generally adopted by my suppliers, and, as they themselves say, it prevents risk of rejection, and saves many a can of milk in a season.

SOUTH AUSTRALIAN BUTTERFAT PERCENTAGES.

By G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

To ascertain the quality of the milk in the State I requested the managers of the largest district factories to furnish their average monthly butterfat percentages, together with the weight of milk required to make a pound of butter.

The information will be of value, as it will give an idea of the requirements of each district in the way of breeding milking stock and what attention has been devoted to feeding, &c.

The following has been received from six factories:—

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
<i>Upper North.</i>												
1 Wilmington..	3·7	3·7	4·1	4·3	4·1	4·1	4·0	4·0	4·0	4·0	3·8½	3·7
<i>Middle North.</i>												
2 Eudunda	3·8	3·8	3·8	3·6	3·6	3·6	3·6	3·6	3·8	4·0	4·0	4·0
<i>South-East.</i>												
3 Mt. Gambier..	3·7	3·7	3·7	3·9	3·7	3·6	3·6	3·9	3·6	3·7	3·8	3·9
<i>Hills District.</i>												
4 Gumeracha ..	4·0	4·1	4·2	4·2	4·1	4·1	4·0	3·8	3·8	4·0	4·2	4·4
5 Clarendon ..	4·2	4·0	4·0	4·2	4·2	4·4	4·6	4·4	4·0	4·2	4·2	4·2
6 Kondoparinga	3·7	3·7	3·7	3·7	3·5	3·5	3·6	3·6	3·6	3·6	3·7	3·7

Pounds of Milk per Pound of Butter.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1.....	24·1	24·3	21·7	20·8	21·9	21·9	22·4	22·7	22·7	22·1	23·2	24·3
2.....	24·0	24·0	24·0	25·0	25·0	25·0	25·0	25·0	24·0	22·0	22·0	22·0
3.....	24·4	24·3	24·0	23·4	23·9	23·9	23·8	23·9	25·0	25·9	24·2	23·9
4.....	22·5	22·0	21·0	21·0	22·75	22·75	22·75	24·0	24·0	22·5	21·0	20·0
5.....	21·12	22·14	22·11	21·7	21·7	20·12	19·15	20·2	22·15	21·8	21·12	21·1
6.....	22·5	22·5	22·5	22·5	23·5	23·5	23·0	23·0	23·0	23·0	22·5	22·5

These records are in some districts exceedingly creditable and would be difficult to beat in Australia or in any part of the world. Our State is most favorable to high butterfat percentages and good flavor in butter, but these great qualities are not taken advantage of in any district. In South Australia much could be done by cultivation of green fodder, as the quantity of milk yielded by the average cow is comparatively low. The milk has the great advantage, however, of being rich with the butterfats of a solid nature, and not so readily lost in the process of butter-making and cheese-making. With care in breeding and feeding South Australia could raise the standard of the present splendid fat percentages, and it is to be hoped that farmers will keep this object in view and strive to maintain and further increase the good position we already hold.

Quality of City Milk.

Rich as the above averages were, we do not usually find similar percentages in the supplies from city milkshops, but too frequently the fat falls below the 3 per cent. reading. City milk with 2·2, 2·5, and 2·7 per cent. of butterfat and over 90 per cent. of water gives much cause for believing that the quality has been tampered with.

To illustrate the good quality of milk yielded by suburban cows I examined twelve samples from individual animals supplying milk to town customers, and the following percentages of fat were recorded:—4·9, 4·8, 4·8, 4·6, 4·5, 4·1, 4·0, 3·9, 3·7, 3·7, 3·5, and 3·5.

The cows giving this milk were not selected, but were taken at random from average dairies. From one farm several non-selected cows were tested at the express wish of the owner, and the fat readings were as follows:—3·8, 5·5, 4·4, 4·4, 4·8, and 4·6.

LOSSES OF FAT IN BUTTER-MAKING AND CHEESE-MAKING.

By G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

A long series of experiments have been in progress to find out to what extent the acidity and temperature of cream at churning affects the percentage of fat in buttermilk.

In thirteen successive tests made at one factory the following results were obtained:—

Percentage of Acid in Cream at Churning.	Percentage of Fat in Buttermilk.	Temperature of Cream at Churning.
0·89	0·4	56° F.
0·80	0·4	57° F.
0·88	0·6	58° F.
0·90	0·6	59° F.
0·84	0·5	57° F.
0·84	0·6	58° F.
0·63	0·3	55° F.
0·56	0·2	56° F.
0·57	0·2	56° F.
0·57	0·2	56° F.
0·55	0·2	56° F.
0·55	0·2	56° F.
0·65	0·3	55° F.

From these figures it will be gathered that the losses in fat are greater with a high percentage of acid in the cream, and this is again increased when the temperature of the cream at churning is also high. In other experiments it was found that cream with 0·85 and 0·90 per cent. of acid did not lose much of its fat when the churning temperature was kept as low as 55° F.

Although these losses are not high, still the comparisons in the table are enough to prove to the butter-maker that great care is required in handling cream for churning. In factories where refrigeration is adopted there is a great saving in the churning of overripened cream, and the expenditure incurred in providing artificial cold is speedily returned by the increase in the quantity of butter manufactured from what would have been otherwise lost in the butter-milk.

Cheese-making.

Cheeses poor in butter fat can be attributed to many causes, viz., uneven cutting and careless stirring of the curd, rapid development and excess of acid during cooking, also cooking the curd too rapidly and at too high a temperature, hooping at excessive temperatures, and quick and heavy pressing. Inattention to any of these points will cause loss of fat. As a previous number of the *Journal* has dealt with this subject, I will briefly state what has been done with the assistance of the acidity apparatus to demonstrate that excess of acid causes loss of the most valuable constituent, fat.

To prove this by actual results I append the following tests:—

	Fat in Milk.	Fat in Whey from Curd after Salting.	Fat from Press.	Acid at Pressing.
	Per Cent.	Per Cent.	Per Cent.	Per Cent.
A	3.5	0.3	0.8	0.85
B	3.4	0.9	1.2	0.95
C	3.6	1.1	1.2	0.90
D	3.7	2.1	3.2	1.0

The percentage of acid at pressing is high in the three latter cases, while the fat percentages are correspondingly high in the curd before and after pressing.

It is reasonable that fat will escape when the particles of curd become speedily contracted—a condition which takes place when there is a rapid development of acid or a quick and high temperature. To avoid these heavy losses in butterfat the “secret” is to have the milk as near as possible to a fixed acidity, which can be readily ascertained by the use of the acidity apparatus, and by gradual and careful cooking.

Boracic Acid in Milk for Cheese-making—A Dangerous Practice.

In the investigation of weakness in cheese I have been tempted to suspect the free addition of boracic acid preservatives to milk. At one factory where trouble was experienced I had an examination made of a sample bottle of milk taken from the vat. After a careful analysis it was shown to contain .006 per cent. of boracic acid, a quantity capable of doing considerable damage. The action of this acid in the milk would arrest the development of acidity in the curd, and cause a milky whey. The curd, in place of becoming firm and shotty, would be soft and slushy, hence butterfat would be permitted to escape in large quantities. If suspicion is aroused that preservatives are freely used, cheese-makers would do well to forward a sample bottle of milk for examination.

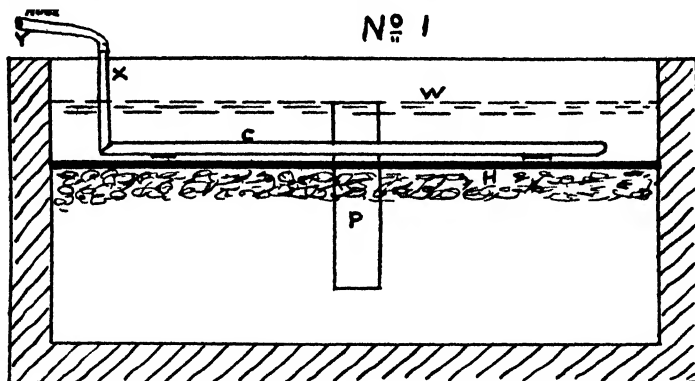
PROFITABLE SOURCE OF NITROGEN.—Nitrogen is the most costly of all the manures; but there is an unlimited quantity of it in the atmosphere. Legumes, by aid of nodule-making microbes on the roots, abstract a lot of nitrogen from the air. But in the stable, the cow-byre, the pigstye, &c., there is a great quantity allowed to waste. In 10 galls. of urine there is as much nitrogen as would be found in 7 lbs. of nitrate of soda or 34 lbs. of bonemeal. By sprinkling pulverised or calcined gypsum about the gutters, &c., where the urine flows, or in the pits, or on dung heaps, or other places where similar refuse collects, the loss of nitrogen is prevented and all bad odors are destroyed.

ATTEMPERATEURS OR COOLERS IN WINE FERMENTATION.

BY J. G. KELLY, McLAREN VALE.

The use of coolers in wine fermentation is as yet in its experimental stage, and a great deal has yet to be done in perfecting the system and making it more effective. The principal trouble to be overcome is drawing off the heat that accumulates in the centre of the cap, whether submerged or floating. The best results that have as yet been attained have been through using two coolers in the tank, one resting on the false head, the other 9in. below the false head, and therefore in the centre of the submerged cap.

The majority of Australasian winemakers have adopted that system of cooling which is defined as "cooling in the tank," and use attemperateurs of tinned copper tubing, the copper used being about the thickness of 24-gauge iron, and made in the form of a large gridiron. The tubes are either round and $1\frac{1}{2}$ in. diameter, or oval 2in. x $\frac{3}{4}$ in. diameter, or flat-sided 2 $\frac{1}{2}$ in. x $\frac{1}{2}$ in. set on edge—the latter are considered to be the best. The spaces between the tubes are about 5 $\frac{1}{2}$ in. The cooler is immersed in the "must" and cold water run through



it at a speed equal to carrying off the heat that the cooler acquires from the liquid surrounding it, and the speed of the water is regulated by testing its temperature as it runs from the cooler. The size of the cooler is proportionate to that of the superficial area inside the tank, the cooler being 18in. shorter and 18in. narrower than the tank; this will give a clear space of 9in. between both the ends and sides of the cooler and the ends and sides of the tank. For a tank of the superficial area of 7ft. x 5ft. a cooler measuring 5ft. 6in. x 3ft. 6in. is required.

The amount of cold water required for any given quantity of wine to be made depends upon the temperature of the grapes when crushed and the amount of heat generated and confined within the fermenting tank, and this latter varies with size of tank, nature of and relative proportion of must and skins, thickness of the walls, and surroundings of the tank, method of keeping the cap submerged, barometric pressure, temperature of the air, &c. It has, however, been estimated that approximately the quantity of water at 60° F. required to keep the temperature of the fermenting must below 82° F. for four days (this being the usual time during which the temperature of the must has to be kept down) is ten times the volume of the wine fermented, i.e., 10 to 1. A fermenting tank that will run 1,000galls. of wine requires an average of 105galls. of water (at 60° F.) per hour during the stage of violent fermentation.

If the water after passing through the cooler, or series of coolers, is run slowly over shallow trays, or cooled by any other means, and returned to the tank or well from whence it was drawn, provision would have to be made for a supply of sufficient water for twenty-four hours' use. Twenty thousand gallons of water at a temperature of 60° F. would be ample for a winery making 100,000 galls. of wine annually.

Fig. I. gives the position of the cooler C resting on the false head H, 6in. below the surface of the liquid W, the pump tube P for pumping the liquid from the bottom in order to bring it in contact with the cooler, the upright neck X of the cooler tapered to receive the end of a lin. hose Y conveying the water to the cooler (the water exit corresponds in shape and size to that of the inlet, and can be either in front or at the back).

Nº 2

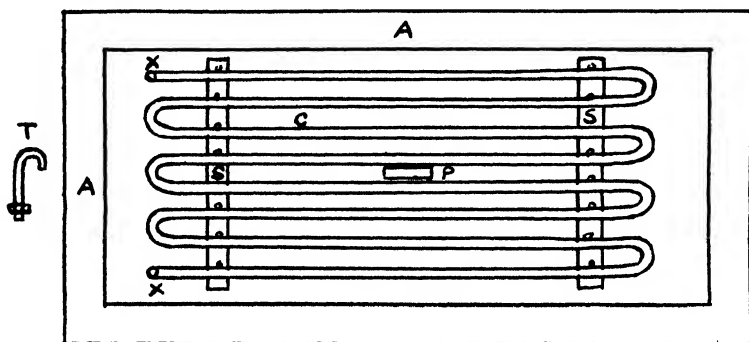


Fig. II. represents the surface of the tank and cooler looked at from above. A A side and end walls of tank, P pump tube, C cooler, X X water inlet and outlet, S S straps of stout tinned copper to keep cooler rigid and fixed to the cooler by means of hooked bolts T.

POULTRY NOTES.

By D. F. LAURIE.

Yards and Houses.

It is a difficult matter to lay down any hard-and-fast rules on this subject. When the matter of expense does not come into consideration it is an easy matter to say what is best and most presentable. Many people have to make the best with what materials are at hand, and, in reading these notes, should remember that the chief point to avoid is the use of any material which will harbor vermin. The question of building houses *versus* allowing the birds to roost in trees is one that occupies the attention of many writers. It may be pointed out that unfortunately there are many localities where trees, or even bushes, are rare; again, you cannot house poultry (except guinea fowls, turkeys, and peafowl) in large gumtrees, they also cannot roost in small scrub bushes.

If young birds roost on the branches of small trees they are liable to crooked breasts, which spoil their sale as table birds. Perches can be fixed in certain trees in the form of a ladder; they must be attended to frequently or vermin will soon be troublesome; the birds also will quarrel for the highest perch. Trees, even pepper trees, become infested with vermin, including the poultry tick (*Argas reflexus*). The common practice of allowing poultry to sleep in

stables and machinery sheds is a bad one; the vermin are troublesome to horses and cattle, and one gets covered with them when getting harness, &c.; it is a dirty practice in addition. Hens which sleep in the open in all weathers do not lay as well as those properly housed.

Ventilation without draughts is one of the chief points to be observed in construction. Insufficient ventilation and draughts both cause diseases. We are generally advised to build the houses facing east. This is a survival of memories of a cold climate; the chief consideration is the direction of prevailing winds. In exposed situations houses should have a movable shutter, so that if the wind is from the south that side of the house should be closed and the opposite side left open. Of course, if the house can be built among thick

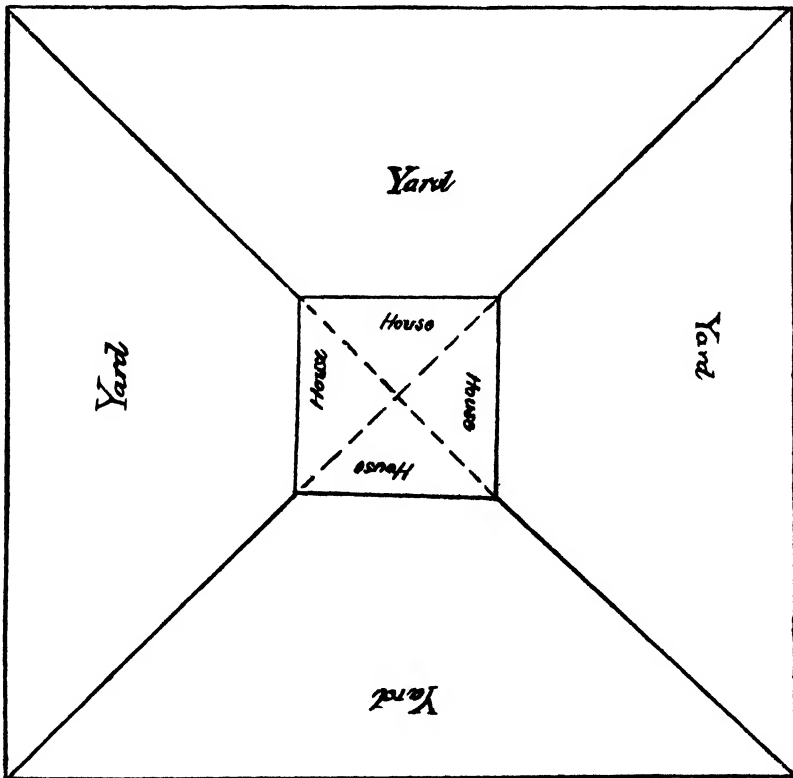


FIG. 1.—A CONVENIENT ARRANGEMENT OF YARDS AND HOUSES.

bushes this point need not be considered. In ordinary cases fowls sleeping in trees are not in a draught; the majority in open-fronted houses are in a draught. At any rate, select the most sheltered position. Timber, owing to cracks, is liable to harbor vermin; therefore, if possible, use galvanized iron; of course, wooden houses can be kept free from vermin with regular attention, and even iron houses will become infested if neglected. Bags, bark, &c., are not to be recommended. Boughs and scrub are sometimes used; but they soon rot, and are sure to become harbors for vermin. Straw could be used, and would make very cool sheds; but the vermin question again crops up. For

ducks, at any rate, the following shed would suit. Make of the required size as follows:—Put in posts 6in. or 8in. in diameter, to form an oblong shed, say, 8ft. or 10ft. wide; put a frame on of 4in. x 4in. timber. Fasten large-meshed wire netting on both the inside of the posts and the outside. Procure some clean dry straw and fill the space between the two pieces of wire netting, and ram tightly; this will make the back and ends. Strain some fencing wire across the top to form rafters and support the roof, which is made by covering the top with wire netting; pack tightly a couple of feet thick with straw, and cover with wire netting. You can make good light doors out of 4in. x 1in. deal, netting both sides, and the 4in. space filled with straw. Where seaweed is obtainable it answers even better. It will not be a difficult matter to renew the straw from time to time. There is a danger of fire, but this sort of shed is cool, and ample ventilation can be provided.

Where ample space is at hand, I should always advise building the houses a good distance apart; in cases where only a limited area is to be had, a convenient arrangement is seen in Fig. .1

Where one wishes to economise wire netting, this arrangement, while allowing each pen to have its small yard, permits one pen to have an extended range at a time. By allowing one pen freedom in the morning, and another in the afternoon, each pen has freedom every other day. On a larger scale the divisions shown as yards may be large enough to supply sufficient ranges. The divisions in the houses shown by dotted lines are better made of iron; wire netting would encourage fighting, and probable damage would result.

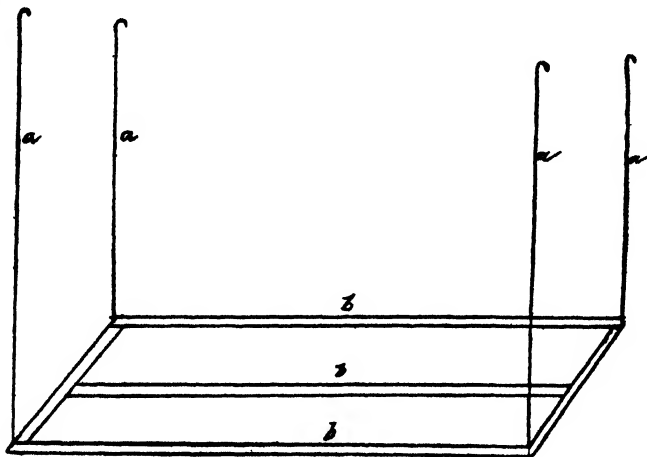


FIG. 2.—HANGING PERCH.

Framed hanging perches are advisable; if not suspended they should rest on legs which can stand in vessels containing sheep dip or kerosine water. If the house is infested with tick the pest will reach the birds whatever sort of perch you have, they will drop upon the birds from the roof. It will be seen that each suspender, which may be made of fencing wire, has a hooked end to hook into corresponding wire loops suspended from the roof, the perch is then easily detached and removed for cleaning and disinfecting. Planed hardwood, free from cracks, is to be used, and may be tarred with hot coal tar. Round poles with the bark on are unsuitable. We are told that a flat perch cannot be gripped by the birds' claws. This is not quite correct, but it is as well to bevel the edges; a bird can grip a perch at will, but it is only when sitting down

that the grip is automatic. Side stays may be required to prevent the perch swaying. It need not hang more than two feet from the ground—less is better for heavy birds; as all the perches are of one height there will be no quarrelling for the top one. All doors and gates should be self-closing; this is easily managed by means of a piece of fine galvanized binding wire attached to the gate or door and passing over an empty cotton reel for a pulley and having a piece of iron or any heavy weight at the end.

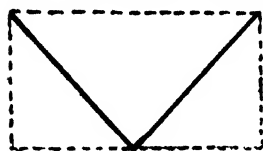


FIG. 3.—END VIEW OF TROUGH.

This shows the end view of a simply made trough. Two pieces of board the same width are screwed or nailed together at right angles, as shown by the thick line. The ends may be of similar board or tin, as shown by the dotted lines. Wooden troughs are condemned by some, but for all that they are safer than tin or zinc, as there is no danger of metallic poison. The man who does not keep wooden troughs clean would neglect any other sort.

All troughs should be cleaned immediately the birds have been fed; as only enough food should be given at a time there will be no delay. Where the houses and yards are in a row it saves time to have the food and water troughs outside, as they can be attended to without entering the yards, and can be removed for cleaning and returned filled. They must be under shelter. This is attained by

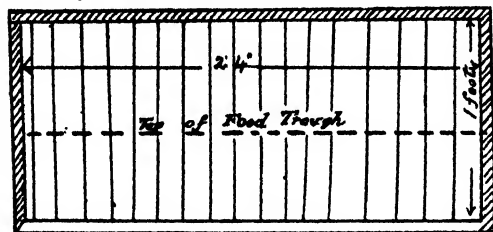
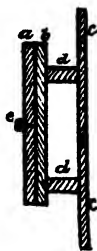


FIG. 4.—BARS FOR TROUGH.

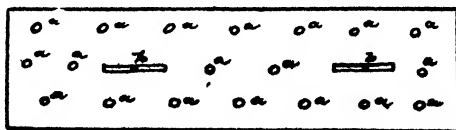
making a frame say 2ft. 4in. x 1ft. with bars of stout fencing wire so spaced that the birds can get their heads through, a sufficient sized opening is made in the wire netting of the front of the yard, and this arrangement is fitted in and fastened. A similar design is used as a cover to the troughs for feeding in the open.

Fig. 5 shows details of a ventilator as it should be made. One part of the sketch shows the front view; two pieces of galvanized iron may be used, the outer piece fitting between the turned down edges of the other so that it can slide to and fro; holes, say an inch in diameter, are cut in both pieces, so that when the ventilator is open to the full extent the holes *aa* in both pieces are exactly opposite; by moving the outer piece the size of the apertures can be



Section of Ventilator.

FIG. 5.—SECTION OF VENTILATOR.



Front View, showing airholes in Ventilator.

diminished. If board is used, the outer one has a couple of slots cut in it, and screws *bb* screwed into the inner piece marked *b* in the sectional view to support. In the section the holes are not shown—*a* is the movable piece, *b* is fixed to the side of the house and to the spacing-blocks *dd*; *e* is one of the screws working in the slot; *cc* is a spreader, and may be of tin or galvanized

iron. The air entering the ventilators hits the spreader and so passes up or down or to both sides, and is equally diffused with an absence of draught; a spreader should be twice as large as the ventilator, and answers well if made of fine wire gauze, such as fly-proof doors, &c., are made of. Ventilators on opposite walls of a poultry house should not be directly opposite one another. Roof ventilators are more difficult to make; they must be in the form of louvres, with the inner edge of the blades turned up to prevent ingress of driving rain.

To Catch a Fowl

generally means a great disturbance, and often its plumage is damaged. A simple device obviates all this. A piece of No. 8 fencing wire is bent, so that a fowl's leg will fit easily in the crook; turn the other end into a small loop and fix to the wooden handle with a screw and a couple of staples. A catcher 8ft. long generally suffices. Proceed quietly, having first offered some grain or other inducement; stand behind the bird and jag him gently, and draw towards you, moving your grip; he will come quietly, and rarely is there a flutter. No fuss and no damaged feathers. After a time it will be found that old stagers keep one eye on the "catcher" and skip out of an embarrassing position with much skill. Never carry poultry head hanging down; this does much harm to them; a fat bird may not recover the ill effects, and they always flutter. Grip the legs firmly and place the bird on the left arm; there is room for as many as you can grip the legs of.

Co-operation.

In England, the National Poultry Organisation Society is doing what I have often urged as a worthy scheme for co-operation. They market poultry and eggs for members, and, from all accounts, the scheme works well. If purchasers here could rely on the quality of table poultry, and the freshness of the eggs offered by any body or society, much better prices would soon be obtained. There is no doubt about the fact that the producer does not get his proper share of the price the consumer pays; the time is hardly ripe for dealing direct with the consumer as the English society does, but there is ample room for improvements in many directions. It is as a rule a difficult matter to obtain fresh eggs in Adelaide. Some I recently inspected were obtained by a tradesman of high standing, from a customer who could be depended upon, so I was informed, also that these eggs were guaranteed as new laid; not one was under *seven days old*. People do not realise that if they keep an egg for three or four days it is no longer fresh; the distributor does the same, and the buyer gets an egg good enough for cooking, but not what a fastidious person requires. Then, again, look at the slipshod methods of packing; a large dealer tells me the losses in broken eggs are very heavy, and that even when the prices are high no more care is taken than when eggs are a drug. A new practice in England is to display new laid eggs of various tints in small boxes containing twelve; as all the eggs are guaranteed and tested before selling, there is a great run on these boxes. Here are the hints, let our traders co-operate or sell under a brand, so that reliance can be placed on the goods. I see no reason why all eggs should not be branded with the date of laying as well; it would be satisfactory to know whether a little salt would suffice or whether the egg would require to be eaten in a dark room and flavored with bisulphide of carbon. Forewarned is forearmed.

FEEDING FOR BACON.—It has been found from repeated experiments that the best results in bacon production are obtainable where mixed rations of grain food—such as oats, peas, barley, and maize meal—are employed in preference to one or the other of these foods by itself.

ORCHARD NOTES FOR FEBRUARY.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The summer is proving cooler than usual. It is also noted for an absence of any soaking rains thus far. Although evaporation may not be so great as in hotter summers, the trees in some places are showing signs of lack of moisture. A cool dry summer is often a treacherous season. Many trees, particularly those of the citrus family, become injuriously dry at the roots before any outward evidence is displayed.

When signs of dryness are noted and water applied the rush of sap stimulates a growth which in its turn tends to cast off the growing fruits. The best test for moisture is found in digging out holes here and there to a depth of about 1 ft. among the trees. The necessary irrigation may then be carried out before the tree hangs out signals of distress. Where irrigation is practised great care must be taken in the after treatment of the soil. Unless steps are constantly taken to avoid it, the physical character of the soil is bound to deteriorate. As soon as the soil has lost its stickiness after each watering the rings or channels should be stirred deeply, to avoid the formation of a hard pan which will form more or less in all subsoils possessing a fair proportion of clay. It will be noticed that large cracks often open in the water furrows before they are dry enough to permit of pulverisation. When at all practicable it has been found that a light harrowing or hoeing *across* the channels will cover the surface thinly with dry fine soil, and thus avoid the formation of cracks and much loss of moisture which would occur before the more complete after cultivation would be possible. Lands which are not irrigable should receive careful attention after storm showers in summer. It has been found by practical and scientific workers that not only does the recently-fallen moisture evaporate more rapidly from a rain-crust surface, but that a capillary connection is thereby established with the lower strata, and it in turn yields up its moisture more quickly.

Orchards in full bearing can scarcely be cultivated at this period. Should heavy rain storms occur, however, any free exposed surface should be stirred, as, in the drier districts at any rate, the trees require all the moisture obtainable.

The harvesting of fruit crops is now in full swing, and many kinds are very abundant. Plums and pears promise to be a drug in the market. The State seems overstocked with plums of a most inferior character. When seasons of abundance occur this fruit scarcely repays for picking, but still fruit-driers say they cannot procure sufficient supplies of suitable sorts. The remedy should suggest itself. In some of the apple-growing districts cool weather and misty showers appear to have supplied the humid conditions required for the rapid spread of fusiladum, and "scabby" apples and pears are plentiful.

The exporting of apples will begin in the latter end of this month, and it is to be hoped our exporters will maintain the high position our fruit has gained in the European markets. Only the best-developed fruits should be gathered at this period, as the smaller ones then will have a better chance of enlarging when the tree is relieved of a portion of its burden. An apple should be harvested when the stalk separates from its parent spur without any particular strain. Usually, raising the dependent fruit to a vertical position will cause the stalk to separate if the fruit is sufficiently matured. The browning of the pips also indicate maturity; but as varieties differ in the depth of color on the pips, one requires experience with each sort in this test. Apples gathered at this early period—early for exporting kinds—should have any surplus moisture evaporated from their skins in a dry cool shelter (a couple of dry days will suffice) prior to being packed for transport. The fruit-harvesting season

should reveal the results of any experimental work performed upon the trees, and the grower who lives amongst them and is conversant with the season and soil should be in a position to sum up any results accurately.

The budding of all kinds of fruit trees will be in hand now. These buds will, of course, remain dormant throughout the winter and break into growth next spring. As the top growth of the stock plant will not be cut away until the winter, great care must be observed in attending to the ties. The abundant flow of sap which makes the operation of budding easy causes a rapid enlargement of the stem also. Should the ties remain unloosened, constriction of the stem must occur at that point. The sap is prevented from reaching the bud from above or below, and consequently it perishes. This is very frequently the cause of many failures in the budding performed by amateurs. Too much stress cannot be laid upon using buds from prolific bearing trees only. The growth from the bud usually reproduces all the characteristics of its parent in this respect, though the stock may impart greater or lesser vigor of growth as the case may be.

In late districts the long laterals on young apple and pear trees should be fractured above the second or third bud. The leading shoots should not be touched at this period, unless the growing point be pinched out of extra strong ones. This is done as a temporary check, and to allow the weaker shoots a chance to catch up to those more favorably situated.

The codlin moth is exceedingly troublesome this season, and the growers should take every means within their power to restrain the pest. From many localities come complaints of neglect to bandage, &c., on the part of growers, unless the inspectors urge them on with threats of legal proceedings. This is deplorable, and shows clearly that many growers do not wish to combat this pest. The bandage system has proved itself the world over an effective means of destroying vast numbers of the caterpillars if the growers will only use it intelligently. However, this season those persons who may be detected distributing the infected fruits will be promptly prosecuted. They may in the end find it much cheaper to attend to the pest in the orchard than in the Police Court. It is not safe during midsummer to leave the bandages unexamined over a fortnight, as the insects rapidly transform from larva to pupa, and from the pupa the moth emerges very quickly and begins again the cycle of egg-laying upon the almost or quite full-grown fruit. All fallen fruits should be collected and submerged in water for twenty-four hours at least before being fed to stock; all props, pegs, stakes, &c., should be removed; storehouses constructed so that they may be made air-tight if necessary, so that they may be fumigated at a suitable time; the soil beneath all infested trees should be smooth and clean. This pest must be circumvented at every known stage if its subjection is to be hoped for; its extermination is now practically impossible in South Australia.

NOTES ON VEGETABLE-GROWING FOR FEBRUARY.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The season, with its sudden and repeated cold changes, does not seem to have favored the production of summer vegetables. Cool and dry weather necessitates the use of much water for growing crops.

Tomatoes now require plenty of water, and the same applies to melons of all kinds. When ready the fruits should be constantly cut from all kinds of marrows and cucumbers if the cropping is to continue. Tomato plants can be benefited by a sprinkling of superphosphate and sulphate of ammonia, which

should be washed into the soil. Beans should never suffer from the want of moisture, or they will be practically ruined. The final sowings of these will be made during this month.

On the plains country first sowing of peas should be made early in February. The soil should be soaked, and when workable dug deeply. Manure may be applied if required. Superphosphate or fine bonedust are the best for peas. After sowing mulch the surface with about 1 in. of finely-pulverised manure, and if possible refrain from applying water further until the plants appear. As soon as they begin to peep through the ground stretch a thread of black cotton along over the sprouting plants about a couple of inches off the soil. This usually frightens the sparrows until the leaves toughen. Overhead watering by means of sprinklers of various kinds gives the best result in growing these early crops of peas.

Towards the end of the month prepare the soil as described above and make sowings of carrots, parsnips, turnips, spinach, and red beet, mulching the surface thinly with finely-pulverised manure, and if the whole of the surface is not mulched keep the spaces between the rows loose with fork or hoe.

In last month's notes I described how seed beds are made for raising young plants that require transplanting. Sowings of cabbage, cauliflower, Brussels sprouts, lettuce, onion, and celery should be made in these and carefully attended. The young plants (excepting the onions) should be thinned out to 2 in. or 3 in. apart so that their foliage may receive sufficient light to develop sturdily. The root system for a time would be apart, and the plants can be lifted with a ball of earth as required. The early strong start thus obtained often makes a success of the crop, and gives it a distinct advantage over the gaunt weakly plants taken from a crowded seed bed.

Asparagus plants will ripen their seeds, and as soon as the tops yellow cut away the seeding stems and thus avoid a crop of unwelcome plants later on. Rhubarb will require water on the plains, and flower stalks must be constantly removed. When clearing away the remnants of a season's crops burn all diseased stalks, &c. If no disease has been noted put the decayable portions into the manure compost heap so that the ground may have this waste returned to enrich it.

One of our most succulent summer vegetables on the plains is silver beet. If the plants are mulched and receive plenty of water a good supply of succulent stems and leaves may be obtained from a dozen plants.

In cool shady places make sowings of radishes and cress for salad purposes. With the advent of longer and cooler nights these should thrive now.

MILDURA NOTES.

Delightful weather has prevailed throughout January, but a good warm spell is needed to bring the sugar well into the grapes.

The apricot crop turned out unusually heavy, far exceeding all expectations. Peaches have ripened well, and the factories will be very busy till the Elberta crop is finished. The demand for fresh fruit has not been very keen. Prices have ruled from £5 to £7 per ton.

Currant-drying is in progress at the end of the month, and a record yield is anticipated. Of the large growers one with twenty acres, which yielded 15 tons dried last year, estimates 20 tons this season; another, with ten acres, calculates on 15 tons this year as against 10 tons last season.

Sultanas promise an average crop.

A very large yield of Gordos is counted on, and a famine in drying trays is threatened, as, owing to the high prices ruling for timber, importers were careful not to exceed the assured demand.

Contrary to expectations the river has continued open throughout January, thus enabling the apricot crop to be promptly placed upon the market, and growers, for a change, to realise quick returns.

The third watering of the season, which is arranged to serve all vines as far as possible before raisin-drying commences, is progressing satisfactorily.

The annual election for two new Irrigation Trust commissioners awakened an unusual amount of interest among settlers, and resulted in the return of Messrs. Thompson and Hoops, two old and tried men.

There is a certain amount of dissatisfaction with the management of the Trust, but it is probably less than at any previous time, and settlers are recognising that their commissioners are honestly and earnestly striving to make the best and most economical arrangements possible for the distribution of water.

They have a big legacy of difficulties to contend with, and the multiform complications in land tenure make the collection of rates on unoccupied lands a difficult matter, and otherwise render it difficult to bring expenditure within incomings. A scheme for supplying water by measure is under consideration, and, failing that, some system of differential rating will probably be devised in the anticipated event of an increased charge for water being found necessary. A pound or two more or less on the acre of good sandy land is a small consideration; but any—the smallest—increase would be felt on the sterile blue-bush country.

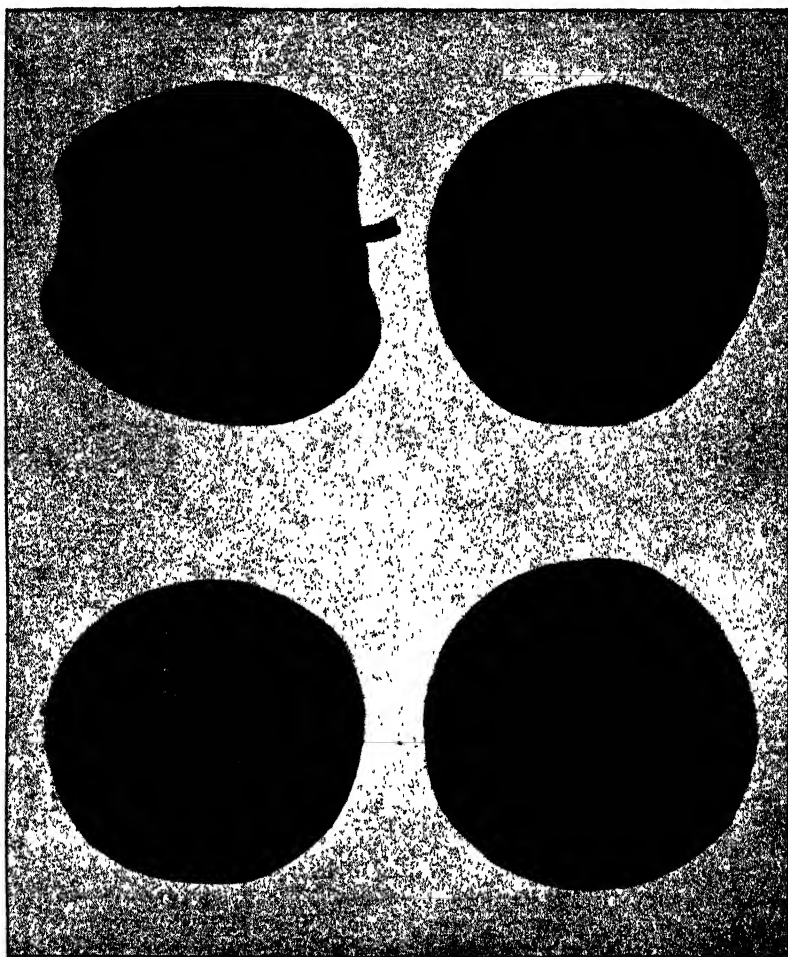
The question of introducing phylloxera-resistant vine-stocks has again come up for consideration. Certain settlers, with excellent motives no doubt, have wished to obtain American vines from the Victorian Government for planting in Mildura. Against this possibility the local Horticultural Society a short time back entered a strong protest, taking its stand on the report of the Melbourne Phylloxera Conference of 1899, presented by Messrs. Professor Perkins and Quinn to the South Australian Government, and printed in the *Journal of Agriculture*.

DRYING FIGS ON A SMALL SCALE.

Dried figs are very wholesome and nourishing, in addition to being pleasant to the taste. There are many people who own two or three fig trees, which produce much more fruit than can be used whilst fresh, and it would be comparatively easy to cure the surplus for consumption at some future time. An easy way to cure figs is the following:—Gather the figs when fully ripe and rather on the shrivelled side—but not turning sour. Spread the fruit in a single layer on wooden trays, always under the shade of a thickly-foliaged tree. Trays may be made of three broad palings nailed to a couple of cleats. (If placed in the sun the figs become leathery and nearly black.) When the skin has toughened—but not dried—place the figs in a wire-net basket, and dip for three seconds in boiling water; lift out, let drain for a couple of minutes, then dip again for three seconds. This must be done three times. After the third dip, let the water drain off completely, and pack the fruit whilst still warm in boxes that have been lined with paper. Lay the figs one by one in the shallow boxes, in layers, pressing each down by the stalk until the box is full; and, if procurable, lay on top a few leaves of laurel or cherry tree. One of the reasons for packing so soon after the dipping is that the moths have no chance to drop their eggs on the fruit, and thus there will be no caterpillars or “worms” or “maggots” in the boxes for a time.

SOME VALUABLE APPLES FOR EXPORT.

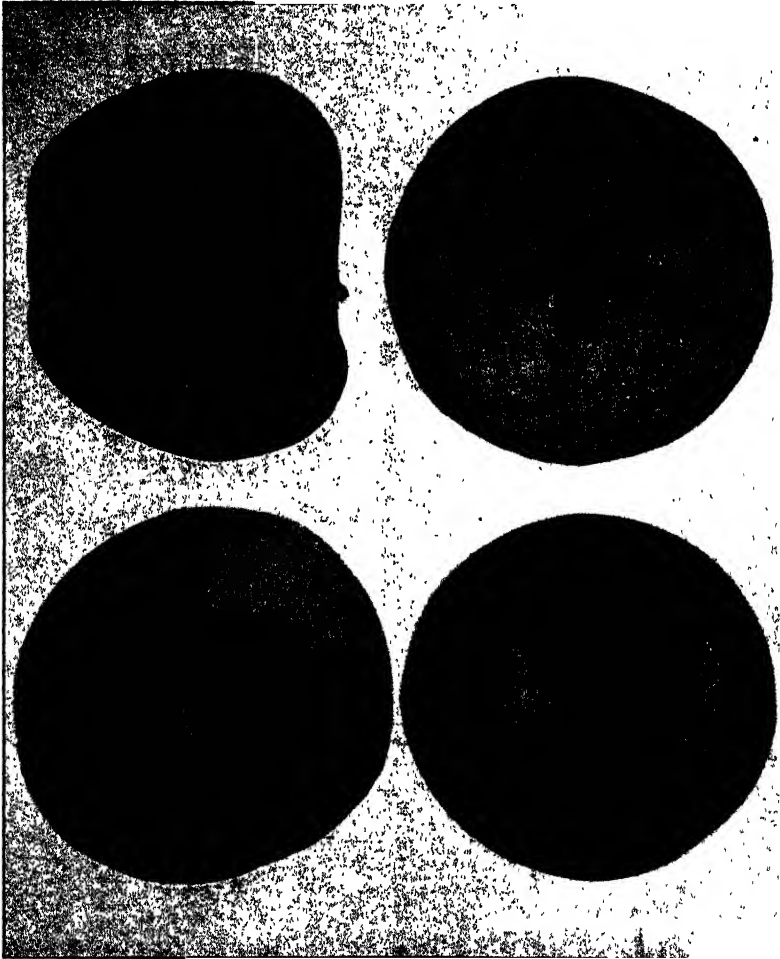
BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.



CLEOPATRA.

Cleopatra (*New York Pippin*, *Pomeroy*).—This apple holds the pride of place as an exporting variety. The tree is of a thriving habit and a most regular and prolific cropper, but subject to diseases when grown in damp, low-lying positions. The *fusicladium* attacks the foliage and fruits badly, and the mysterious "bitter pit" ruins large quantities of the fruits grown in such damp localities. On well-drained hillsides the finest keeping fruits are produced. The South-East, below Naracoorte, or the wet and cold portions of the Mount Lofty Ranges do not as a rule produce a good type of this apple for export or late keeping. Gumeracha, Kersbrook, Barossa, Clare, and Wirrabara districts appear best suited to the *Cleopatra*. The origin of the variety seems doubtful,

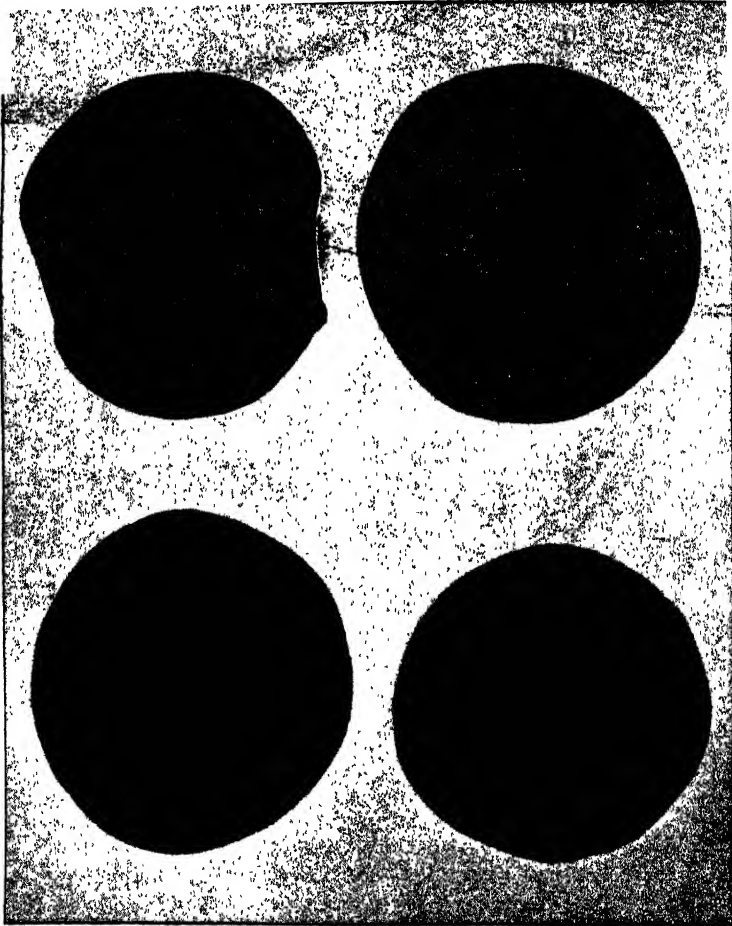
though generally attributed to America. The fruits have a pale clear green skin, sometimes faintly colored on the sunny side, dotted over with white specks when growing. When ripened the skin is of a rich canary yellow and still shows the white dots. It is oblong in shape, and an average specimen measures 3in. x 2½in. The stalk is usually long and slender, set deeply in a regular and smooth cavity. The calyx cup is moderately deep, and the calyx tube continues often into the seed vessels, thus sometimes admitting germs of decay to the centre of the fruit. The flesh is white, crisp, and sub-acid. It keeps well, and is useful for dessert or kitchen purposes.



DUNN'S SEEDLING.

Dunn's Seedling (Monroe's Favorite, Ohinemuri).—This fruit is usually looked upon as a kitchen apple here, but in London it must be highly valued for dessert purposes, judging by the prices received for it. The tree is an upright, thriving grower, but only a medium cropper. It seems to be pretty

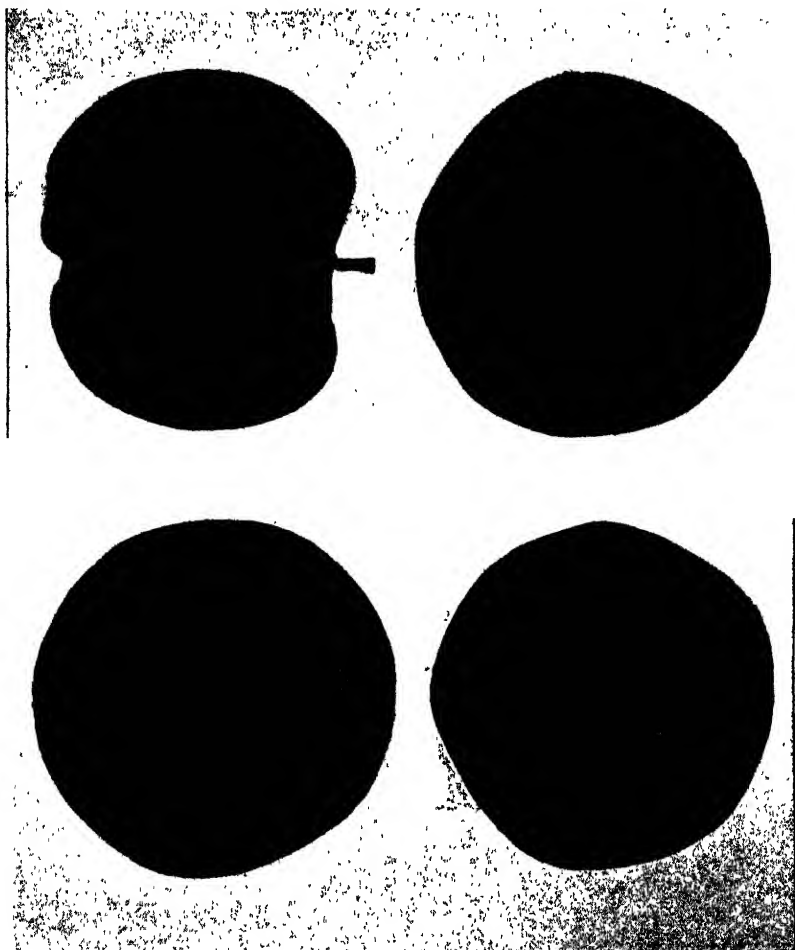
well suited in all the apple-growing districts of the colony. The fruits are not subject to diseases to any great degree. An average specimen measures about 3 in. in diameter, and 2½ in. long from stalk base to calyx. The skin of the fruit is light green when growing, and around the stalk the russetting breaks into deep cracks, often spoiling its keeping qualities. The cheek on the sunny side takes a faint to deep crimson blush. When ripened the skin is smooth and pale yellow. The stalk is short and basin regular, the calyx leaves are closed and set in a fairly deep, even, and smooth basin. The flesh is white, close-grained, and solid. The fruit is usually an excellent keeper. The origin of this variety is in doubt, but it is most probably of an Australian production, Victoria, South Australia, and New Zealand each claiming it.



ROME BEAUTY.

Rome Beauty.—This is an excellent variety of American origin. The tree is vigorous and prolific, and rarely seriously affected by diseases. It thrives equally well in all fruit growing districts of this State. The growing fruits are

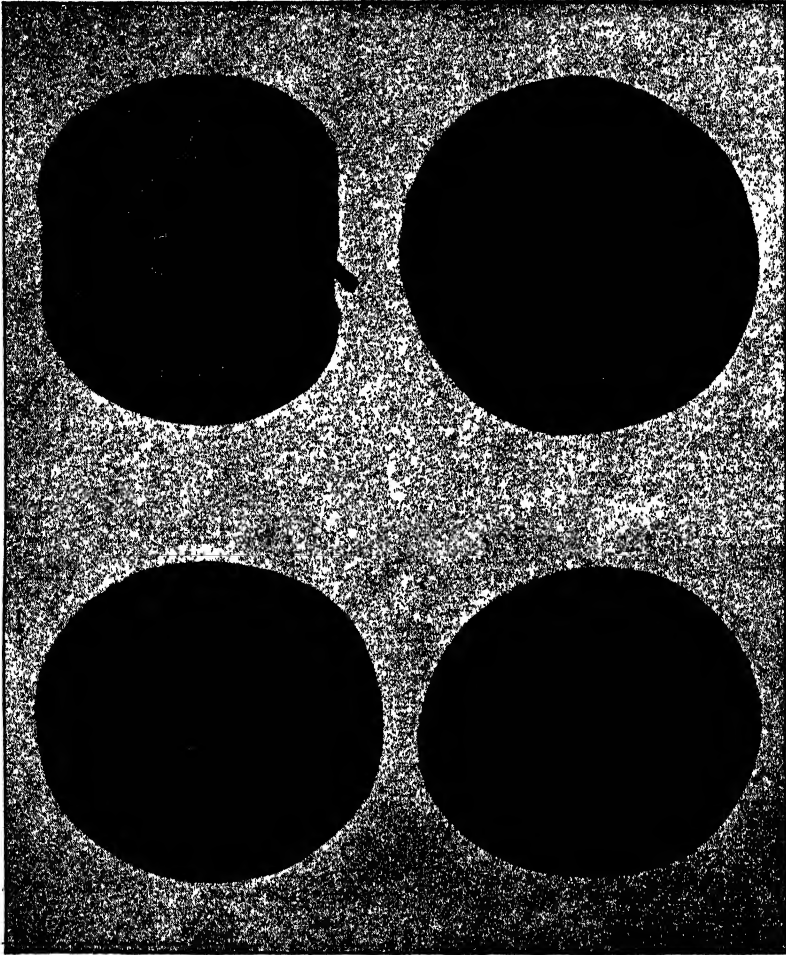
pale green, but when mature turn to a pale yellow, shaded and striped most handsomely with bright red, and sprinkled with light dots. The flesh is pale yellow, crisp, and briskly sub-acid when first harvested, but becoming mealy and flat when kept a long time. It is an apple whose appearance vastly outlasts its flavor. It ripens late and will keep a long time. A fair specimen measures $3\frac{1}{2}$ in. in diameter, and $2\frac{1}{2}$ in. from stem to calyx. The stalk is usually long and slender, and fills the base of a smooth, regular, green, funnel-shaped cup. The calyx leaves are erect and are set into an even-shaped, fairly shallow basin.



LONDON PIPPIN.

London Pippin (Five Crown Pippin).—This is a sturdy dark-green tree, growing with short jointed wood, and, as the name implies, is of British origin. It thrives best in cool districts, such as the Mount Lofty Ranges and South-East, and enjoys a fair immunity from diseases. When growing the fruits are

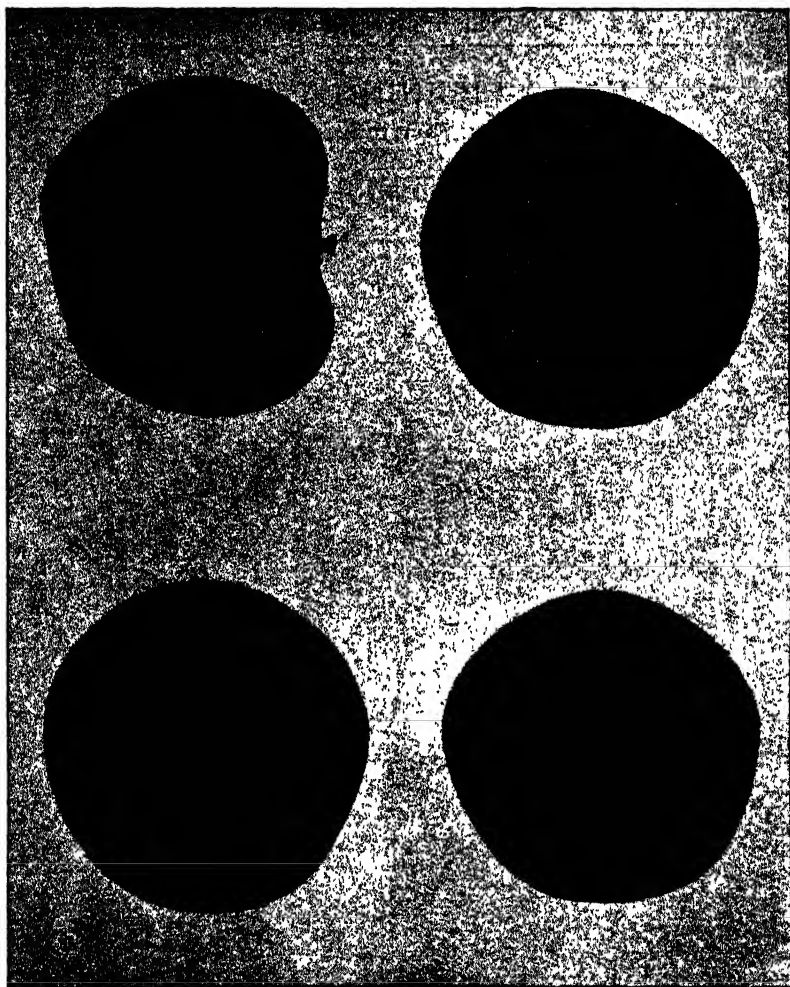
pale greenish yellow, but when ripened the skin turns into a beautiful yellow, with a brownish-red blush over the sunny side. The flesh is pale yellow, brisk, and pleasantly sweet, somewhat resembling the Cleopatra. An average fruit measures 3in. in diameter by 2½in. deep. The stalk is fairly long, and its cavity deep, broad, and smooth. The calyx leaves open slightly. The calyx cup opens out into five deep indentations, the raised sides of which form the "five crowns." It is sometimes confounded with the Wellington pippin or Dume-low's seedling, but the latter only shows the crowns *within* the calyx basin, and not on the whole end of the fruit, while its flavor is also distinctly acid.



STRAWBERRY PIPPIN.

Strawberry Pippin.—This variety is of doubtful origin. The tree is an erect grower, a good bearer, the fruits being fairly free from diseases, but having a tendency to crack badly if exposed to autumn showers. The fruit reaches the best quality in cool, hilly districts only. The Mount Lofty Ranges have thus far

produced the best samples. An average fruit measures 3in. long by 2½in. in diameter. The stalk is fairly long, set in a narrow even cavity. The calyx is open with reflexed leaves, and is set in a shallow cup. The skin of the growing fruit is pale green with indistinct stripes of faint red. Over the surface light dots are very conspicuous. When matured the skin is pale yellow, handsomely flaked and striped with a rich reddish crimson color. The flesh is greenish yellow, and the flavor brisk and sub-acid. The fruits keep a long time, and retain their flavor over a very long period.



STONE PIPPIN.

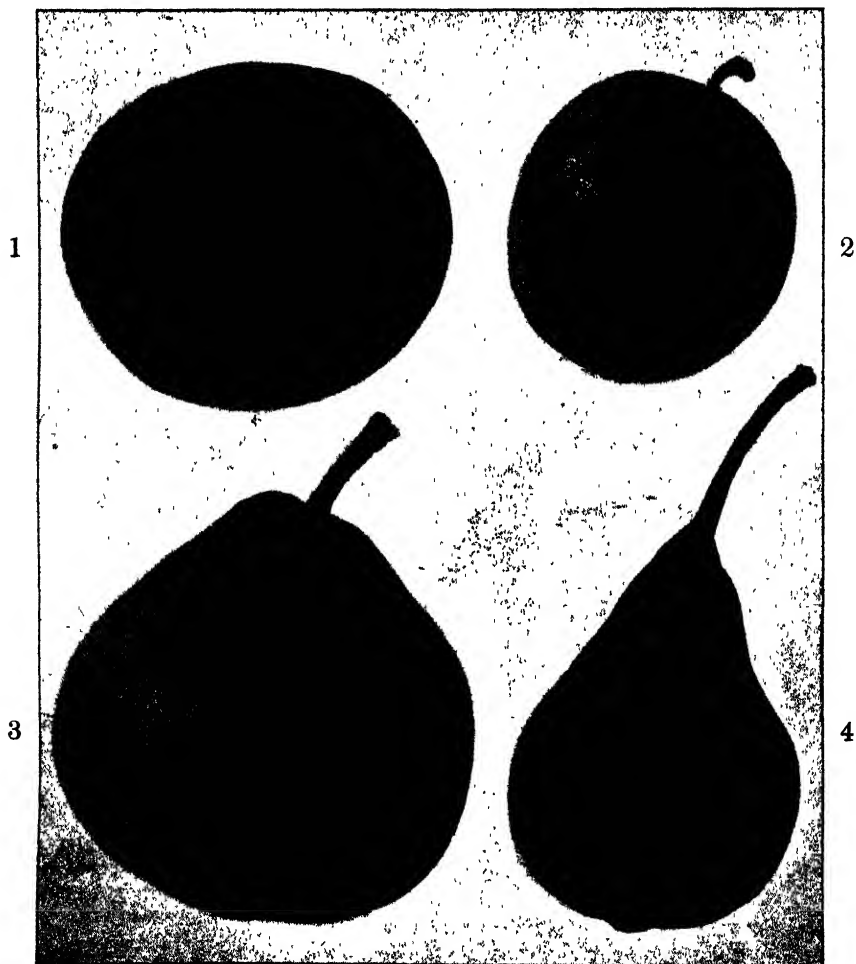
Stone Pippin.—This variety is probably of English origin. The tree is a good grower and prolific bearer in damp cool places, and the foliage has a peculiar twisted and wilted appearance. In drier positions the fruit is inferior, and falls badly from the trees. It is suited in Mount Lofty Ranges and South-Eastern

climates best. When growing, the fruits are of a very pale green color and dotted with white specks. When mature, a darker green is assumed. Sometimes the exposed sides are colored brownish red. The skin is smooth, and the fruits are peculiarly free from diseases. An average fruit measures $2\frac{1}{4}$ in. in diameter and $2\frac{1}{4}$ in. in depth from stem to calyx. The stalk is short, and set in a narrow shallow cup, which is lined with a rough cracked russety skin. The calyx is closed and set in a round regular smooth basin. The flesh is white, solid, and crisp, with a sub-acid flavor. After being kept a long time the flavor improves. This is probably the best keeping apple we possess, and, though second rate in flavor, has carried to and sold uniformly well in London.

EARLY-RIPENING FRUITS.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

For local market purposes early-ripening fruits of various kinds are deemed most profitable to the grower. Through the kindness of Mr. H. Wicks, of



Payneham, I have been enabled to figure four fruits, of which more may be heard in the future. Fig. 1 represents the Early Rivers nectarine. This is described as a heavy and certain cropper. The fruit photographed measured 2½ in. by 2 in., and was not quite ripe. The skin is of a rich crimson tint on the sunny side, and light yellow, tinted with red, on the shaded side. The flesh is tender, rich, and juicy. It was raised by Mr. T. F. Rivers, of Sawbridgeworth, Herts, England, and received the first class certificate of the Royal Horticultural Society of Great Britain in 1892. These credentials and the present appearances promise well for its future here, where nectarines thrive so well. The writer had ripe fruits from Mr. Wicks' trees on January 10, and this season is without a doubt a late-ripening one for this class of fruits.

Fig. 2 depicts the Tragedy prune, which originated in America. It is a healthy thriving tree, producing almost elliptical fruits. They have a very dark skin, covered with a dense bright blue bloom. The average size is about 1½ in. in diameter and 1½ in. long. The flesh is greenish yellow, juicy and sweet, somewhat resembling that of the Kirke's. The stone is large and flat. Mr. Wicks says "the Tragedy is fit to gather for packing by December 20" with him, and its flavor and appearance certainly surpasses any of our early kinds and general cultivation.

Fig. 3 represents Beurre Gifford pear. This, according to Hogg, has been in cultivation since 1825 in Europe, but does not appear to have received much attention here. The fruit is rather below medium size, being about 2 in. in diameter and 2½ in. long; skin smooth and greenish yellow, mottled, with red on the sunny side; the stalk is very long, and the eye closed and set in a very shallow depression; the flesh is white, sweet, and melting, and the flavor decidedly rich. Mr. Wicks says it ripens very early in January in his orchard.

Fig. 4 is the fruit of a tree received by Mr. Wicks from America as the "Wilder." It is a bell-shaped fruit of medium size. The exposed side of yellow, covered over with a brownish crimson. The flesh is pale yellow and is good quality, very melting. The fruit is handsome, and keeps a few days after picking. With Mr. Wicks it was fit to gather at Christmas. This tallies fairly with the American descriptions available, and whether the name is correct or not will not detract from the value of the fruit.

THE HORIZONTAL TRAINING OF TOMATOES.

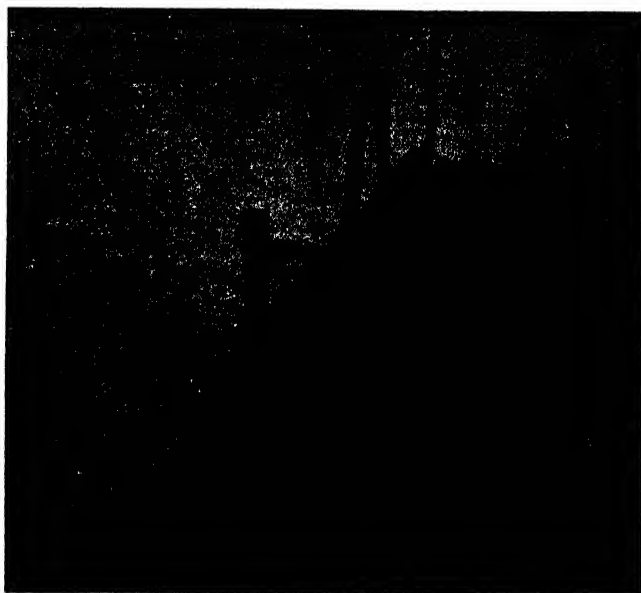
BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

Every grower of these plants knows the damage caused to the fruits when the plants rest upon the soil. The moisture from irrigation furrows and the depredations of insects often spoil a large proportion of the best fruits. Several years ago in a country district I saw a rude support made of old sheepyard hurdles resting upon stones horizontally used for this purpose. Such materials being unobtainable in my neighborhood, one naturally thought of wire netting. For several seasons past I have utilised this method, and now confidently recommend its use to all suburban and small growers of tomatoes.

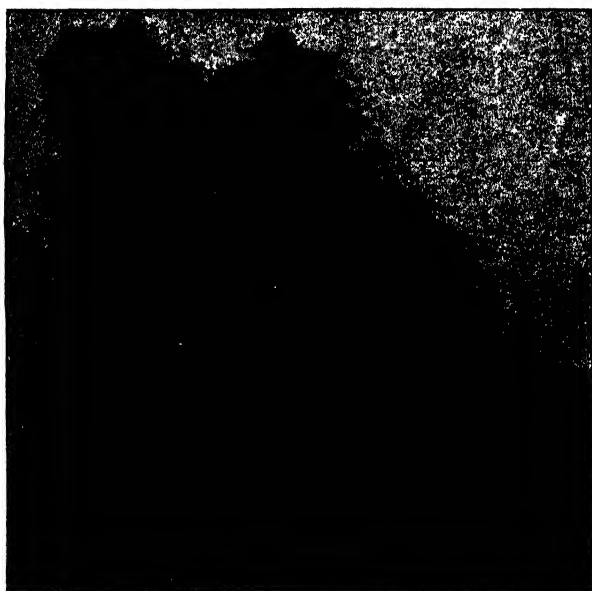
It is cheap, as the materials last for years. It is quickly placed in position, and combines many other advantages.

The method I have adopted is as follows:—The tomato plants are set about 4 ft. apart in straight rows. Along each side, at about 4 ft. or 5 ft. apart, stakes are driven in firmly, leaving about 15 in. standing out of the ground. These rows of stakes should be at least 3 ft. apart. The netting should be of wide

mesh and the same width as the rows of stakes are apart. It is stretched along about 1ft. above the plants, as shown in Fig. 1. If the plants are set out early, or without soil on their roots, a bagging or brush shading can be laid upon the



No. 1.



No. 2.

netting immediately above each plant. This is a good protection from frost at night or hot sunshine in the daytime. As the plants grow, their stems come up through the meshes, and a little attention by the grower will distribute them evenly along the central foot of space as they are growing through. Growth then proceeds as shown in Fig. 2. When the shoots become topheavy they fall down each side and rest upon the netting, as seen in Fig. 3. This method of spreading out the branches permits light to penetrate sufficiently throughout the plant to cause flowers to be produced in great abundance and in even distribution all along the stems. The fruits set well and grow evenly. When



No. 3.

maturity is reached the warmth arising from the ground beneath and the atmosphere above ripens them completely. They are, as stated previously, exempt from the rot-producing fungi which thrive on the damp surfaces when the fruits rest on the wet soil, and caterpillars do not so readily reach them. I have not yet applied any pinching or heavy thinning of the shoots, as is done by our commercial growers to plants trained on single stems and tied to vertical stakes, but would recommend some enterprising grower to apply those practices to a row or two trained horizontally. For a limited area of tomato plants grown for early markets I think something valuable may be evolved from this method. It will certainly repay the suburban resident or the farmer for the little extra trouble taken in producing tomatoes for his own use.

FARM NOTES FOR FEBRUARY.

BY THE EDITOR.

Stubble lands should be harrowed over as soon as possible to aerate the surface by breaking up the crust. This will also allow all light rain to soak into the soil, and will cause seeds of all kinds to start into growth with the first rains. Where the field is to be left for grazing it will be desirable to sow 2lbs. each of white mustard and Essex rape per acre. This will generally result in an early and good crop of green fodder to augment the feeding capacity of the farm. The cattle will also derive more benefit from the straw and chaff that has been saved from the late harvest. In the hilly districts and cooler parts of Australia the Hungarian brome grass (*Bromus inermis*) should be sown for pasturage and hay.

Maize, holcus, and all kinds of sorghums and millets are in the best condition for ensilage when the seeds are beginning to become hard. Pit ensilage is best for cows, and probably for all other stock, and is much less wasteful and easier to make and manage than ensilage in stacks. A pit, when once properly made, will last out several generations of owners; and when the silage is once properly made it will keep good for several seasons secure against fire. Well-made pit silage possesses all the good properties of the feed as originally growing in the field without any diminution; but most dairymen find it profitable to add to its efficacy by also feeding the cows with bran, copra cake, linseed, and other concentrated foods.

Silage, however, will always be improved in nutritive value, and will be all the better liked by the stock, if a number of varieties of nutritious plants is included in its composition. Pea straw, vetches or "tares," bean haulms, oats, barley, kail and beet leaves, and many other plants could be used to make the silage more grateful to the animals. If succulent plants are used they should be in layers not more than a foot deep between layers of drier and rather absorptive fodder. Chaffed straw is an excellent food when siloed in layers with cabbage, kail, or mangold or beet leaves. The silo should seldom be more than 8ft. wide, but may be as long and as deep as may be convenient for getting the silage out. As the silage sinks in the pit it may be filled up to the surface as often as there may be fodder to put in it.

In localities where rain is liable to make the fields too heavy and wet to work upon at seeding time it is desirable that the phosphate or other fertiliser should be drilled in now. This will lighten the work of drilling in the seed alone, and it will be finished in half the time that would be required for drilling seed and manure together. Owing to the much heavier crops being taken off the land through the use of phosphatic fertilisers there will be a necessity sooner or later to replace the potash and nitrogen removed with those heavier crops. Experiments should be tried with the addition of a little sulphate or muriate of potash and nitrate of soda, or similarly-constituted manures, on small areas, to show whether benefit will accrue from their use on a larger scale on the farm. Lands intended to be left for grazing would also be much benefited with an application of all three of the above substances.

Where the subsoil at a depth of 4in. to 8in. consists of a heavy marly clay or loose rubbly limestone nodules it would be a fatal mistake to plough so as to bring it to the surface; but if half an inch to an inch of the marly subsoil can be stirred up and mixed with the good surface soil, then benefit will result. The limestone nodules must not be stirred up; but, as far as possible, the subsoil should be consolidated. Sandy lands may be easily ruined by being loosened up at the wrong time, and much careful observation is necessary in

order to avoid the disaster of subjecting the unprotected surface to the influence of drifting winds. Many thousands of acres of valuable arable soil have been covered and ruined through sand drifting from exposed sandhills.

When land is almost perfectly dry it is not only very difficult to plough it, but it is also very injurious to the "mechanical condition" of such soil to break it up. It comes up in blocks or clods which will not dissolve or break down with the heaviest rains or the most persistent cultivation. Even though the surface may be pulverised the soil beneath will remain cloddy, with considerable open spaces between. The consequence is that crops flourish during spring, but directly the hot dry weather comes on the moisture rapidly escapes from the clods, the roots of the plants fail from want of water, and "takeall," "blight," "rootfail," or whatever it may be called, kills the crop.

Sow seeds of cow cabbage, kale, &c., at any time from February till end of March for planting out when large enough. One pound weight of seed will furnish enough plants to cover several acres if all should germinate, but it is unsafe to provide less than 1lb. for each acre. Two rods of nursery bed will raise enough plants for an acre. The soil should be very rich, well pulverised to a good depth. Three feet to 4ft. between the plants will allow just enough space for horse cultivation, but 2½ft. x 4ft. in rows will do better. Cultivate very frequently, but do not put the implements deeply, as this will injure the roots. Liquid manure will greatly stimulate the plants when they have got a good growth on.

Sugar beet, mangolds, and other root crops cannot thrive and give the best results unless the surface soil is kept constantly free and open by the use of the hoe. The same remarks apply with equal force to all kinds of summer crops. Two inches of the surface must be kept in a pulverised condition. This prevents evaporation, and allows air to penetrate to the roots. All such crops will benefit considerably from applications of fertilisers of a soluble nature, and more so if given in a liquid form. Sugar beets and globe mangolds should be grown where the soils are shallow, and the larger kinds of mangolds on the deeper soils.

The best time to eradicate bracken ferns is during January and February. They should be mown down and left to dry and then burned, taking great care to isolate the patches from adjacent grass lands. It may require three years to totally exterminate the pest. A quicker method is to enclose the patches and put on a good number of pigs, which will root them out.

When turning stock from dry feed on to green crops of any kind there is considerable danger of tympanitis. The animals should have been well fed prior to turning them on to the green stuff, and then allow them at first to have ten minutes only. If they show any signs of bloat at once give each one affected a tablespoonful of carbonate of soda in a wine bottle of water.

Where night frosts are neither early nor severe it is advised to sow lucern, so that the plants may be strong enough to battle through the winter. The field must be deeply and thoroughly pulverised, and made as level as possible. Sow the seeds in drills 1ft. apart, about 8lbs. to 10lbs. per acre, 1in. deep; then roll to press the soil on the seeds, and, when the plants are fairly started, use light harrows or the Planet hoes to loosen the surface between the rows. The finer and more level the surface is made the better will be the prospect of a good stand of lucern. It will do best on rich deep, moist alluvium, where there is a proportion of lime in its composition, and better still where there is water not deeper than 14ft. from the surface.

In the South-East and hilly country south of Adelaide prepare for sowing grasses and clovers. The Hungarian brome grass (*Bromus inermis*) has given excellent results in some of the American States, and will certainly do well in some parts of South Australia,

"Cocky chaff" and straw should be protected against fire, water, and all other contingencies at once. Some farmers have stacks of hay still unthatched, others have a good deal still standing in cocks or scattered by the winds over the fields, and peas are still lying in the haulms where they were mown weeks ago. It is of no use offering suggestions to such neglectful farmers, but they are courting serious losses through their own neglect.

BROOM CORN CULTURE.

(From the American Agriculturist.)

Owing to the high prices which have prevailed during the past two years for broom corn brush, many farmers are anxious to learn as much as possible before planting time regarding the culture, harvesting, and marketing of this crop. And owing to commercial brush being grown in so few and restricted localities, the general farmer knows little about the up-to-date (cheapest and most expeditious) methods of growing and harvesting it on a large scale.

The writer having grown broom corn, and lived in the famous Illinois broom corn belt during the last twenty-eight years, is in position to give the latest practical information upon the subject in question. Broom corn thrives on any ground that produces good Indian corn; indeed, they make a good relation. On ground that will average 40 bush. of corn per acre during a series of years an average yield of 650 lbs. of broom corn brush can easily be produced. There are upwards of twenty varieties of broom corn grown in the United States to a greater or less extent. But the "Evergreen" varieties are almost exclusively grown for the manufacture of kitchen brooms. There are several so-called varieties of Evergreen broom corn; but, according to the writer's experience in growing them, all of them are one and the same variety, their slight characteristic differences being caused by climatic and soil influences. Missouri Evergreen, Improved Evergreen, and Tennessee Evergreen are the varieties which produce the bulk of the commercial brush in the counties of Edgar, Cole, Clark, Cumberland, Moultrie, Douglass, and Piatt. These counties (of which Arcola, Douglass county, is the centre) constitute the greatest broom corn belt on earth. The three above-named so-called varieties are almost identical. The outcome of a broom corn crop depends to a very great extent on how thickly the seed is planted. It must be planted thick enough so the matured brush will not be too coarse or too short. If too thick in the row the heads will be too short, and if too thin in the row the fibre of the brush will be too coarse to command the best price. The writer plants 110 seeds per rod with a broom corn seed-planting attachment, which can be used on almost any two-horse cornplanter. A final stand of eighty-five growing stalks per rod of row is about right here for the production of the greatest amount of high quality brush. One bushel of good vital well-cleaned seed will thus plant sixteen acres in rows $3\frac{1}{2}$ ft. apart. Broom corn should be planted just after you have finished planting Indian corn, but not before that time, for, like sorghum cane, the soil must be very warm in order to secure a good even stand. Two inches in depth is about right for the seed here.

The writer has seen good crops of broom corn brush produced here when the seed was planted after our Indian corn was beginning to tassel, or in about seventy-five days after planting. But our experience here is that it should begin to head about the time our usual summer drought begins, or about ninety days after the seed is planted. For if it forms its head at a time when frequent summer rains prevail, a certain per cent. of the heads will become twisted and crooked. This detracts considerably from its value and price. The broom corn

plant grows very slowly until it becomes about 3in. in height, after which time it greatly outstrips Indian corn in growth. While it is small, and even before it appears above the surface of the soil, is the all-important time to vigorously cultivate it with harrow and small shovel cultivator. After the young plants reach the height of 2ft. their subsequent growth is so rapid that all weed growth is quickly smothered out. Our Evergreen broom corn reaches a height here of 12ft. to 14ft. Our broom corn growers have decided that the proper time to harvest the brush is when the seed is in the dough. Formerly harvesting was begun when the seed was "in the milk," but the growers have learned that the brush is of just as good quality and considerably heavier if the brush be not harvested before the seed has reached the doughy or semi-hard state. With improved machinery and up-to-date methods of handling the brush the cost of harvesting a crop has been reduced at least 60 per cent. during the past thirty years. When ready to harvest, two rows of growing broom corn are bended down across each other so that the heads of each row rest at the other side of either row, and about waist high. The cutters (men with broom corn knives) pass along the outside of the "table" formed by the two broken rows, and cut off the heads at the first blade below the top, being careful to remove this blade at the same stroke which severs the head from the stalk. This blade is called "the boot," and must not be allowed to adhere to the piece of stalk (the piece of stalk should be about 6in. long, besides the length of the head). The heads are then placed in piles on the "table," where they can be plainly seen by the hauler and loaded on a broom corn rack, which occupies the place of a wagon bed. This rack is so constructed that it can be easily tilted at the "shed" to allow of rapid unloading. After a sufficient quantity of brush is cut to keep the "seeder" (a machine which removes the seed from the brush, and which costs about \$150) busy for five hours, the men who cut the brush go to the shed and straighten the heads all one way, sort out the crooked heads, if any, and feed the remainder to the seeder. The heads run through this machine and have their seed removed with great rapidity. The brush is then ready for placing in layers on broom corn sticks (four-cornered sawn sticks are best). Two sticks being placed across an apartment in a well-ventilated, well-covered shed (a good corn crib will answer for a shed), so that their ends will not protrude beyond the edge of the shed, are sufficient for one layer of brush. The layers should not be over 4in. thick and should be at least 4in. from every other layer, so that the air can thoroughly circulate throughout the filled shed. Brush thus shedded will thoroughly and properly cure in about eight days after it is placed. It is then (when the fibre becomes so brittle that it easily snaps asunder when pressed between the fingers) ready for the "baler." This is a machine made expressly for baling broom corn brush for shipment. Let me further impress upon the mind of the reader the importance of cutting and handling the brush only when it is thoroughly dry, and not immediately after rains or heavy dews. Broom corn seeders and balers are run here in the broom corn belt with twelve-horsepower common traction thrashing machine engines. About eight hands are required to properly run a "baler," and about twenty or thirty hands are run to best advantage when cutting and seeding. Such hands command \$1 to \$1.25 per day, including their board. Manufacturers of broom corn machinery send instructors to start up and explain the operation of their machines. When the brush is baled it is then ready for marketing.

The average cost of producing a ton of broom corn brush in the Illinois broom belt is now about \$45. This includes rent on the ground, labor, and incidentals. During the fall and winter of 1898 and 1899 good broom corn brush ranged in price here from \$50 at baling time to \$180 per ton the spring following. In fall of 1899, \$60 at baling time to the present price of \$200 per ton. Present price of reliable seed, \$4 to \$6 per bushel.

BIG MONEY IN TREE-PLANTING.

All the world over, except in Australia, wherever the people are civilised they are awakened to the necessity for tree-planting, and to the profits to be derived therefrom. The following is the latest from the *North British Agriculturist* :—

“AYE BE STICKIN’ IN A TREE.”

Like its fossilised relative, coal, timber has gone steadily up in price within recent months. During the last week or two the price of coal has dropped appreciably, and indications are not wanting to show that a further drop in the price of coal will not be long in coming. But the price of timber, on the other hand, is still rising, and is likely to rise higher still. The serious depletion in the timber stocks in the forests primeval of the New World, and also of Russia, is having a marked effect in the timber trade, especially as the planter has not been keeping pace with the feller in either of these great timber-producing countries. The rise in the price of timber is well illustrated by the fact that on a well-wooded north country estate, which was purchased some three or four years ago, and on which great improvements of a permanent character are being carried out, a large tract of well-grown and well-matured timber was valued for the then proprietor at £40,000, and for the same tract of timber crop the proprietor has now got an offer of £80,000. The owners of forest crops in Ross-shire are making money while the sun shines, and within the last two years over £200,000 worth of timber has been dispatched by rail from the stations between Muir of Ord and Inverness. It is to be hoped that in these districts the tree planter is keeping pace with the feller, for there seems no reason to doubt that in the near future the price of timber will be even higher than it is just now. The moral of all this to proprietors and factors is obvious. The laird of Dumbiedykes said to his son, “When ye hae naething else to dae, ye should be aye stickin’ in a tree. It will be growin’ when ye’re sleeping.” But in these *fin de siècle* days when timber crops are paying so well, the work of “aye stickin’ in a tree” should be energetically carried on, even though there should be something else of great importance to “dae.”

CASTOR OIL GROWING.

So many people have suggested the idea that, as the castor oil plant will grow with very little cultivation in parts of South Australia, therefore the industry ought to prove remunerative. Had there been a possibility of any profit in the work, the cultivation of *Ricinus officinalis* would long since been advocated in these pages. The plant will grow to perfection on the banks of creeks and watercourses, and upon nearly all rich, deep, alluvial soils. They may reach a height of 20ft., and bear good crops of seeds, without any attention whatever, where a creek runs through a rich gravelly alluvium. On ordinary land the plant might be grown in rows at 6ft. to 12ft. apart, giving 1,210 and 302 plants respectively to an acre. In South Australia the climate is so mild that the castor oil plant is perennial, so that the lesser number per acre would most probably be grown. The seeds ripen all the time from November until March, and require to be gathered from day to day. The yield may fairly be estimated at 25bush. per acre per annum, worth about 2s. 6d. per bushel. The smaller varieties produce the best oil for medicinal purposes, and the larger seeds yield oil suitable for machinery purposes. Very considerable quantities of castor oil are used as lubricants for locomotives and other machines in Australia. The cake after the oil has been expressed is very poisonous to all animals; but may serve as fuel, or be returned to the field as manure. The seeds also are very poisonous, though particularly tempting and agreeable to the taste. The plant belongs to the order Euphorbiaceæ, all of which are more or less dangerous. The best oil is extracted by pressure, and the most or greatest quantity is obtained by crushing the seeds and boiling the resultant cake until most of the oil rises to the surface, whence it is skimmed off. This oil soon becomes rancid. The finer oil is obtained by compression, decantation, and filtration. In France, the seeds are macerated in alcohol to extract the oil, which after all is not very good, but is expensive.

WEATHER AND CROP REPORTS.

BAKARA.—The weather has been fairly cool up to the last week. Since then it has been hot and changeable. Stock are in fair condition. Grass feed is scarce, but as harvesting is completed stock now have the benefit of the stubble.

BALAKLAVA.—Harvesting is just finished. The yields are everywhere heavier than previous years. It is considered that this district will average at least 14 bush. per acre. Some farmers have commenced water-carting, there having been no rain to run water, since the beginning of September. There are few complaints of cattle dying, and all stock are in good condition; plenty of dry feed everywhere. Many complaints of bunt in the wheat crops, and some samples have already been refused by buyers.

BOOLEROO SOUTH.—Wheat is just about all cleaned up, and the average is about 12 bush. per acre. Some very heavy crops of up to 30 bush. per acre are reported in sheltered places.

BRINKWORTH.—Everything is cleared up now. The weather has been very favorable for harvesting. There is very little waste. Undrilled or unmanured land went as low as 4 bush. per acre. There will be very little sown with broadcast machines next seedtime.

CARRINGTON.—The weather has been very changeable. No rain has fallen. Farmers have finished harvest operations, and in most cases the results are disappointing. Most people are busy destroying rabbits, which are very plentiful, and if not thoroughly taken in hand will become a great pest. Stock are generally in a fair condition, but rain is anxiously looked for, as the dry feed is getting scarce. Some farmers are making a start to plough, but the ground is very dry and dusty.

ELBOW HILL.—Harvesting is almost completed. Generally the yield is unsatisfactory. The bulk of the grain shows a fair sample, but a good deal is pinched. Hot winds in early October, as well as frosts, rabbits, &c., have brought about the poor yields.

FINNIS.—Weather very changeable, which has delayed harvesting considerably. The yields have been satisfactory.

GAWLER RIVER.—The weather, although cool and pleasant for the most part with a few hot spells, is rather dry, which has a bad effect on the gardens and summer fodder crops where irrigation is impossible, and does not allow fallow working where weeds are growing. The wheat harvest is over; cleaning is just about all finished; the return is good with a good sample. Feed is rather scarce, but the stubble will help along a little. Cattle and sheep are still in good condition. The fruit crop is turning out well; grapes will be plentiful. Rain-fall for last year amounted to 19·07 in.

INKERMANN.—Harvest operations are completed. Weather is keeping dry, and water getting very scarce for domestic purposes as well as for stock, and many farmers water-carting. Stock being in good condition the seriousness of the situation is not much felt yet. There is a possibility of getting one of the water mains through the district, which, in addition to the use of fertilisers, will tend to make the whole district look up.

JOHNSBURG.—Harvest returns are completed; returns very poor. Water is getting scarce in the dams, and some are carting their supplies. Feed in the paddocks will hold out for some time yet, and stock are in good condition. Preparations are being made for seeding.

KAPINDA.—Winnowing is about finished, and the crops have yielded much better than they have done for years. A portion of the hay had to be left in the fields and carted after the reaping was finished, but owing to its being sheaved no bleaching has occurred. The total rainfall for last year amounted to 22·46 in.

LUCINDALE. Have had some rains accompanied by a severe thunderstorm. Hay-carting and stripping is now finished. Waterhole cleaning is now the order of the day, the hot dry weather experienced of late having reduced the spring level considerably. Stock still in good health, most of the flocks being in exceptionally good order.

MILLCENT.—The weather has been most variable—some quite cold days with rain, and some exceptionally hot. The rain has done the potatoes a lot of good. Barley crops turning out well, and also good yields of hay. Wheat-stripping, &c., in full swing, and fair yield expected. Country very dry, and large forest fires have raged on Mount Burr range.

NANTAWARRA.—Stock in fair condition. The summer so far has been generally cool with a few very hot days. Harvest operations are mostly finished, and the yield has been above expectations. Rainfall for the year, 13·44 in.

PINE FOREST.—The weather has been changeable during the month. The cool weather facilitated wheat-cleaning operations, which the majority have now finished. The returns are generally satisfactory owing to use of manures. Stock are in good condition and feed now abundant.

STANSBURY.—The weather of late has been hot. Harvesting is almost-completed, with an average of about 10 bush. The fruit crop is good, and most of the stock are looking well.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

January 31, 1901.

In all but a few late patches the harvest has been safely gathered under fine weather conditions, and the yield generally has turned out satisfactory. The month has been very dry, no rain falling with the exception of some accompanied by violent thunderstorms that occurred near the city. Stock water is fairly plentiful, though, of course, as usual at this time in the summer, supplies in the warmer parts are giving out. Dry feed generally is abundant.

Commercially the late month showed fair activity both in town and country, quite an average volume of trade being done. In many mining districts good progress is being made, chiefly in the opening up of copper shows.

After writing our last report before the holidays the English breadstuffs market hardened, and a sympathetic movement was at once felt here, more particularly at shipping outports, where prices ruled relatively higher than at Port Adelaide. A subsequent weakening in the markets of the Northern Hemisphere, attributed to a renewed desire on the part of American wheatholders to lessen their stocks, however, again caused a slight local decline of about 1d. per bushel. South Africa is buying heavily both wheat and flour in this port, large quantities being in course of shipment and on order, so that again we are apparently having our turn with this very old customer for South Australian breadstuffs. Ordinary trade in flour is doing locally, mostly in fulfilment of bakers' contracts previously entered into. Millers' offal is very scarce, the only holder of any quantity of bran and pollard having cleared out his stocks for shipment at full rates. The Imperial Government order of 3,000 tons of oaten hay on this market has been provided, though it has not affected prices, as the bulk of our stocks are wheat and many holders anxious to sell. In feeding grains trade is quiet; values about even with last quotations.

Supplies of potatoes have been coming forward, chiefly from the Hills districts, but during the past couple of weeks a few trucks have been received from Mount Gambier. There has been a little export trade doing, both for East and West, but this at moment has eased off; values therefore are declining. As local growers will be quite able to keep the market supplied, there is not likely to be any great activity for a few weeks shown in the Mount Gambier potato trade. Nearly all the onions that have been dug are keeping sorts; holders therefore show more inclination to store, with the result that quotations have improved fully 30s. a ton since last we reported this line.

The continuance of dry weather had the expected effect of causing further rapid shrinkage in the local butter supply, so that prices advanced beyond anticipation, and we are still partly dependent upon importations of cream and butter to keep demand filled, and cannot hope to be self-supplying for a couple of months at least, and then only if opportune rains fall. As we reckoned, the glut in eggs did not continue long, and although prices are not high, the month's average has been satisfactory, whilst it is felt that we are approaching much higher rates. The heavy demand for cheese and bacon continued, with the result that for the first time for some months improving values began to show, and the market is about 1d. higher in both lines. Hams have been very scarce. Honey continues dull. Fair quantities of almonds placed at sustaining rates.

In live poultry the market has been active throughout the month, good business being done in all lines at the bi-weekly sales and satisfactory prices realised, no doubt to some extent caused by the abnormally high rates now ruling for beef and mutton in the city.

MARKET QUOTATIONS OF THE DAY.

- Wheat.—Port Adelaide, 2s. 8d.; outports, 2s. 7d. per bushel of 60lbs.
 Flour.—City brands, £6 5s.; country, £5 15s. to £6 per ton of 2,000lbs.
 Bran.—9½d. to 10d.; pollard, 10½d. per bushel of 20lbs.
 Oats.—Local Algerian, 1s. 9d. to 1s. 10d.; ordinary stout feeding at 2s. to 2s. 6d. per bushel of 40lbs.
 Barley.—M. ting, 2s. 9d. to 3s. 6d.; Cape, 2s. per bushel of 50lbs.
 Chaff.—£2 7s. 6d. to £2 12s. 6d. per ton of 2,240lbs., dumped, f.o.b., Port Adelaide.
 Potatoes.—New locals, £5 to £5 10s.; Gambiers', £4 17s. 6d. to £5 per 2,240lbs.
 Onions.—£5 per 2,240lbs.
 Butter.—Creamery and factory prints, 1s. 2d. to 1s. 4½d.; private separator and best dairy, 1s. to 1s. 2d.; store and collectors', 7½d. to 10d. per pound.
 Cheese.—S.A. factory, 6½d. to 7½d. for best matured; good new, 5½d. to 6d. per pound.
 Bacon.—Factory-cured sides 3½d. to 7d.; nice farm lots, to 6½d. per pound.
 Hams.—S.A. factory, 7½d. to 9d. per pound.
 Eggs.—Loose, 7½d.; in casks, f.o.b., 9d. per dozen.
 Lard.—In bladders, 5d.; tins, 4d. per pound.
 Honey.—1½d. to 2d. for be. extracted, in 60lb. tins; beeswax, 1s. 2d. per pound.

Almonds.—Soft shells, 4½d. to 5½d.; kernels, 1s. per pound.

Gum.—Best clear wattle, 2d. per pound.

Live Poultry.—Nice table roosters, 1s. 8d. to 2s.; medium cockerels and fair hens, 1s. 2d. to 1s. 7d.; ducks, small birds, 1s. to 1s. 6d.; prime sorts, 1s. 7d. to 2s.; geese sold from 2s. 8d. for small, to 3s. 6d. for fair birds; pigeons, 8d.; turkeys, prime table sorts, 8d. to 9d. per pound, live weight.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, JANUARY 28, 1901.

Present—Messrs. F. Krichauff (Chairman), W. C. Grasby, R. Homburg, M. Holtze, H. Kelly, J. Miller, T. B. Robson, W. F. Snow, C. J. Valentine, A. Molinoux (Secretary), and J. McColl (Hon. Sec. Richman's Creek Branch).

Wheat-stem Disease.

Mr. KELLY called attention to paragraph in inter-State papers *re* disease in South Australian wheat known as "the killer of wheat stems." It was most unfortunate that such a damaging statement should appear concerning our wheat when we had so much on the water and awaiting. It was bound to injuriously affect the sale of our grain. He considered it a deliberate insult to the Central Bureau and to Professor Lowrie that the Secretary should send samples of diseased wheat to another State without first consulting the members of the Board and the Professor. The action of the Secretary would result in great injury to the reputation of South Australian wheat. He moved—"That no samples of wheat or seeds be sent to Victoria without the Chairman or other members of the Central Bureau being consulted."

Mr. GRASBY said it was impossible for samples to be kept for the Bureau meetings. He moved—"That the Bureau thoroughly indorse the action of the Secretary." The Bureau were greatly indebted to Professor McAlpine for the valuable help he had rendered in identifying samples of fungus diseases and advising as to treatment. To think that any member should complain seemed to him a reflection on their common sense.

The SECRETARY said he was greatly astonished that his action should be so strongly disapproved of by Mr. Kelly. He was in no way responsible for the publication of the paragraph. It was ridiculous for Mr. Kelly to say that it would injure the sale of our wheat, as the disease attacked the plant and prevented the formation of the grain, so that it was utterly impossible for the quality of the grain to be affected. In regard to keeping samples for Central Bureau meetings for the members or for Professor Lowrie, this was impracticable. We had no vegetable pathologist here, and for many years the Central Bureau had been greatly indebted to those of Victoria and New South Wales for their gratuitous services. It was imperative that specimens of diseased plants should be forwarded in as fresh a condition as possible. It was not unusual for his friends to advise him that specimens sent arrived in stale condition, and yet Mr. Kelly would have him keep them two or three weeks for the members to see. With all due respect to the members, he failed to see what good would be done by keeping them, as a trained microscopist was required to identify obscure diseases. To send all queries and specimens connected with cereals to the Professor would simply result in throwing on to him a lot of work he could not possibly attend to. He had quite as high an opinion of the Professor as Mr. Kelly had, and he also knew that he already had as much work as it was possible for him to undertake.

The CHAIRMAN and some other members also thought the members of the Bureau should have been consulted before the specimens in question were sent to Victoria. As neither motion found a seconder, Mr. Holtze moved—"That the Secretary be exonerated, but that in future he should consult Professor Lowrie before seeking the opinion of anyone outside the State." This was seconded and carried.

A vote of thanks to the experts attached to the Departments of Agriculture of Victoria and New South Wales for services rendered was also recorded.

[The following has been forwarded by the Chairman for insertion here.—
GEN. SEC.]

The killer of wheat-haulms (*Ophiobolus herpotrichus*) is similarly attacked as the rye by the breaker of rye-haulms (*Leptosphaeria herpotridioides*). In both the state of the mycelium is alike; also the position, size, and general form of the black perithecia, which are up to 0.75mm. long, but on which the neck is particularly long only. The formation of the spores is different; the sporangia are long and contain eight very thin, thread-shaped, and 0.18mm. to 0.2mm. long spores of a pale yellow color with many cross-partitions. You may sometimes find also species of *Septoria*, or *Phoma*, or *Ascochyta* on the leaves of the wheat; but the *Ophiobolus* destroys by the growth of its mycelium only the lowest part of the haulm down into the rootlets. The plant dies, but the haulm remains upright, and does not break as the rye does from *Leptosphaeria*; it turns prematurely white, and the grain is totally shrivelled in the ears. [Even if sown and germinating, the grain is not likely to communicate infection, as Mr. Kelly fears.—Ch. Agl. B.] The fungus was first observed in Germany in 1894; crops have since been injured upwards from 6 to 75 per cent. The perithecia ripen on the stubbles, and the spores may remain dormant until wheat or barley is again sown. It is likely to prefer, as in Germany, heavier soils—wheat soils. It appeared to the late Professor Dr. Frank that wheat, after pea-flowering plants, was particularly predisposed to the fungus. He recommends, like Professor McAlpine, to plough the stubble soon where the fungus appeared; but in France, he says, phosphatic manures and a good rolling seem to have had a good result (stubble-burning does not perhaps always reach the lowest parts of the haulms). The straw itself, unless uprooted, does not spread the disease; the spores are apparently not ripe at the time of harvesting, and they are quite at the bottom of the haulm.

Standard Weight of Bag of Chaff.

The City Corporation intimated that they had no power to adopt a standard legal weight for the bag of chaff, and suggested that the Government should be approached with a view to inserting in the Local Government Bill power to move in the matter.

The SECRETARY said that the Minister had already promised that the matter would be considered by the Government.

Seeds Received.

The CHAIRMAN tabled seeds of *Sorbus* (*Pyrus*) *aucuparia edulis* received from the gardener to the Grand Duke of Oldenberg. Mr. HOLTZE stated that he had already raised a number of plants of this, and also of the tan plant *Quebracho*, and hoped to have plants for distribution later on.

Conferences and Shows.

The SECRETARY reported that the following Conferences and Shows of Produce had been arranged:—

Northern Branches, at Gladstone, on February 13.

Far Northern Branches, at Quorn, on February 15.

Northern Yorke's Peninsula, at Bute, on February 15.

Murray River Branches, at Mannum, on February 27 and 28.

Southern Branches, at Strathalbyn, on March 22.

Shows of Produce, at Appila-Yarrowie, on February 27, and Cherry Gardens on March 21.

Membership of Central Bureau.

Mr. GRASBY said that three meetings ago the Chairman referred to the indifference displayed by some members in not attending Bureau meetings, and suggested that unless they sent a reasonable excuse they should vacate their seats. He was anxious that the Bureau should derive more benefit from the experience of its members, and this, he claimed, could best be secured by their regular attendance. He moved—"That, in order to secure a more regular attendance and more effective work, the constitution of the Central Bureau be altered so that any member other than civil servants failing to attend for four consecutive meetings without satisfactory excuse forfeit his seat on the Board."

Mr. MILLER seconded.

A lengthy discussion followed, in which Mr. KELLY advocated that the Minister should be asked to add four additional members to the Central Bureau.

Mr. HOMBURG spoke of the inception of the Bureau thirteen years ago, in which he took a prominent part. It had 108 branches. In face of all their meetings, and pages upon pages of reports, he had not noticed that they had done anything very practical. They had been talking a lot that afternoon, but what had been done? Could they show any definite result from their thirteen years' work. He could see nothing.

The SECRETARY said it was impossible, off-hand, to satisfactorily reply to Mr. Homburg's challenge, but he might mention the great extension of the dairying industry, the increased area planted to vines and fruit trees, the treatment of insect and fungus pests, the use of fertilisers, and other improved methods of farming in which the influence of the Bureau had been very marked, and any one item of which fully justified the expenditure incurred.

Several members thought that, having directed attention to the matter, Mr. Grasby might withdraw the motion, as members would no doubt attend better in the future. As Mr. Grasby did not feel disposed to withdraw his motion,

Mr. SNOW moved—"That the motion be adjourned *sine die*."

This was seconded by Mr. ROBSON and carried.

Carriage of Fertilisers.

Mr. KELLY referred to matter of rail freights on fertilisers. In New Zealand fertilisers were carried free, as it was recognised that it paid to encourage their use owing to the increased produce returned. In Scotland also the practice prevailed, and in Victoria a movement in a similar direction was being made. The Victorian Railways Commissioner had expressed a favorable opinion, as he recognised that for every ton of manure carried, 3 tons of wheat would be brought back. He moved that the Bureau endeavor to get the same concession here.

Mr. MILLER thought that it would be better to ask that the fertilisers be carried at cost. The present rail charges came very heavy on the poorer farmers.

The SECRETARY said that unless 3 tons of wheat were produced for every ton of fertiliser used the practice of applying fertilisers would not be profitable. In most cases the increased returns was more than this. He would point out, however, that this matter had been considered at Congress, and the Railways Commissioner had intimated that fertilisers were already carried at lowest rates.

Mr. MILLER was convinced there was some mistake. Minerals were carried at lower rates than fertilisers. It was finally resolved—"That it be a recommendation to the Minister of Agriculture to consider whether fertilisers can be carried on our railways at lowest mineral rates now prevailing."

Extracts and Translations.

The CHAIRMAN tabled the following:—

Size of Cut Tubers of Potatoes for Planting.—Director Clausen has come to the following conclusions after experiments at Heide (Holstein):—1. Large tubers give generally a larger crop, as they contain more nourishment while growing for some weeks; but the cost of these larger tubers is also to be considered. 2. Varieties of potatoes which require a longer time in ripening do not show so much the advantages of larger tubers than early kinds. 3. A dry time during the growth of the potatoes makes the advantage of large tubers much more apparent. 4. Light soil and not in very good heart requires larger tubers than where the soil is first class.

Sprouted v. Non-sprouted Potato Sets.—At the Council Hutton farm in Lancashire the sprouted potatoes gave 9 tons 19cwt. 1qr. 4lbs. big and seed and 1 ton 8cwt. 24lbs. of chats against 8 tons 13cwt. 1qr. 6lbs. big and seed and 1 ton 10cwt. 3qrs. 6lbs. of chats, or a total increase from sprouted sets of 1 ton 4cwt. 12lbs.

*Experiments against Charlock (*Sinapis arvensis*),* or wild mustard, were made in Lancashire with a solution of sulphate of iron of various strength, but later 10 per cent. was adhered to and 35galls. to 40galls. were sprayed per acre. The conclusions arrived at were that the best effect may be obtained during dry and sunny weather, and the spraying should be done as early as possible after the charlock has produced the rough leaf. If a second crop of it appears it is advisable to spray again. Stronger solutions than 10 per cent. are required if the charlock is advanced in growth, without risk of injury to the corn. Experiments made by the late Professor Dr. Frank showed also that *Sinapis arvensis* is destroyed by such solution, also *Senecio vulgaris*, *Taraxacum officinale*, *Crepis biennies*, and *Matricaria chamomilla*; but he used a 15 per cent. solution and 35galls. to 44galls. per acre. The field poppy (*Papaver rhoeas*) unfortunately was but little damaged. Powders consisting of 60 per cent. gypsum, 22 per cent. sulphate of iron, and 15 per cent. sand did not act well.

Experiments with Phosphorite (Natural Phosphatic Rock) and Thomas Phosphate by Dr. H. Sempolowski showed that soft, non-crystallised phosphorites, finely milled, could be used as a phosphatic manure. He used barley sown in boxes without bottom, sunk into the ground, and filled some with a loamy sand, some with peat. Two received no manure, four each phosphorite and Thomas phosphate, one-half at the rate of 48lbs. the other at 96lbs. of phosphoric acid per acre, and some kainit; and the ten boxes containing the loamy sand also burnt lime and nitrate of soda. Thomas phosphate gave on the peaty soil 52 per cent. more with 48lbs., and little more with 96lbs.; phosphorite with 48lbs., 47 per cent.; with 96lbs., 45 per cent. On the loamy sand 46lbs. Thomas phosphate gave 30 per cent. more grain; 96lbs., 60 per cent. more; phosphorite respectively, 42 per cent. and 32 per cent. more than without manure.

Export of Eggs from Egypt.—The German Consul at Cairo states that, in 1897, 13,670,000 eggs were forwarded to England and France; in 1898, 34,982,000; in 1899, 39,761,000; and in the first four months of this year 59,9 9,000 eggs; and England paid thus for these four months £65,915; France, £11,590; and other countries £3,503.

To Find the Age of Cattle from their Teeth.—Dr. A. Bundle (Councillor of Health at Berlin) states that cattle change their inner middle incisors at 2½ years, which are full grown at 3 years; they change their outer middle teeth at 3½ years, and these are full grown at 4 years. At 4½ years they change their corner teeth which are full grown at 5 years, and their neck becomes visible at 9 years. The neck of the molars shows in the 7th and 8th years. With 12 to 15 years most of the teeth drop out.

Fruit Cars.

The Cherry Gardens Branch wrote asking the Central Bureau to urge on the Government the necessity for proper fruit cars being run on the railways in order to secure the carriage of fruit long distances in good condition.

Consideration postponed.

Standard Sample of Wheat.

The Chamber of Commerce forwarded standard sample of South Australian wheat for season 1900-1901. The weight of the imperial bushel had been fixed at 63lbs.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Morgan, H. H. Plummer; Eudunda, F. H. Walter and W. F. Seiber; Naracoorte, A. Caldwell, J. D. Foster, F. Wilcome, and W. Hastings; Cherry Gardens, Mr. H. Strange; Mount Gambier, Mr. D. Norman, jun.

Reports of Meetings.

The SECRETARY reported receipt since previous meeting of fifty reports of Branch meetings.

REPORTS BY BRANCHES.

Inkerman, December 4.

Present—Messrs. D. Fraser (chair), J. Lomman, T. Forrest, C. E. Daniel, C. H. Daniel, W. Fraser, and W. A. Hewett (Hon. Sec.).

LICENSING OF STALLIONS.—This subject was again discussed. Mr. Lomman suggested that it would be better for the Government to give a bonus for approved stallions travelling under certain conditions, and so encourage the breeding of an improved class of horses.

WHEAT EXPERIMENTS.—The Hon. Secretary tabled nine varieties of wheat in the sheaf. These had been grown side by side for experiment. Members were agreed that Marshall's Hybrid was the most profitable this season, the straw being strong and the grain heavy. Ranjit was next best, a tough wheat with long straw, and very suitable for hay. Majestic and Silver King were not early enough for this locality. Golden Return is hardy, but the grain is too small. Dart's Imperial too late for the season. Steinwedel wheat has on the whole been the most profitable variety during the past season.

Eudunda, December 10.

Present—Messrs. J. von Bertouch (chair), C. Wainwright, H. Martin, C. Pfeiffer, E. T. Kunoth, J. A. Fitzner, C. L. E. Lutz, W. Krummel, H. D. Weil, and W. H. Marshall (Hon. Sec.).

DAIRYING.—It was decided to purchase a purebred Ayrshire bull, and to invite the co-operation of the farmers in the neighborhood in the undertaking.

WHEAT EXPERIMENTS.—Mr. Martin tabled splendid samples of Majestic and Silver King wheats grown from Central Bureau seed. The samples were 4ft. high, with splendid well-filled heads.

Kanmantoo, December 6.

Present—Messrs. Thos. Hair (chair), Jno. Hair, A. D. Hair, J. Downing, W. G. Mills, J. Mullins, P. Lewis, and F. Lehman (Hon. Sec.).

HORSE-BREEDING.—Mr. Lewis read a paper on this subject, which he was requested to read at Mannum Conference at end of February. Some discussion ensued as to which horse was the more valuable—the blood or draught horse. Mr. Lewis thought all stallions should be subject to any licence fee that might be imposed, as it would be very unfair if those travelling should be taxed and the man who kept a stallion on his property and took mares in exempted. Mr. Downing thought all stallions offered for hire should be passed by a veterinary surgeon before being allowed to travel. Several members were of opinion that after paying for feed, &c., a four-year-old horse was worth at least £15.

Morgan, December 22.

Present—Messrs. R. Windebank (chair), E. Jacobs, R. Wohling, C. Moll, G. Roediger, H. Hahn, E. French, and J. Wishart (Hon. Sec.).

STANDARD WEIGHT FOR CHAFF.—Members favored the adoption of a standard legal weight for a bag of chaff.

HON. SECRETARY.—Mr. J. Wishart tendered his resignation, as he was leaving the district. A hearty vote of thanks was accorded to Mr. Wishart for his services as Hon. Secretary since the inception of the Branch. Mr. E. French was appointed to the vacant position. It was decided to remove from the roll the names of members who neglect to attend meetings regularly.

Lucindale, January 5.

Present—Messrs. E. Feuerheerdt (chair), E. Hall, B. A. Feuerheerdt, E. A. Matheson, H. Langberg, G. C. Newman, S. Tavender, J. Riddoch, A. Dow, and E. E. Dutton (Hon. Sec.).

"HOMESTEADS AND THEIR SURROUNDINGS."—Mr. E. Hall read a paper to the following effect:—

In the first place a strong effort should be devoted to making the homestead comfortable and attractive, not only for ourselves, but for the employes, for both men and the lower animals do more and better work when properly housed and fed than when neglected. One great factor in making the home attractive and comfortable is a nice well-kept orchard and vegetable garden. In this part of South Australia the orchard and garden must be sheltered against the bleak winds by means of hedges and belts of trees at a reasonable distance. The African boxthorn (*Lycium afrum*) makes an excellent hedge, but the Kangaroo Island acacia (*Acacia armata*) reproduces so readily by seeds, covering large areas if not constantly kept in check. Outside the hedge should be a belt of golden wattle (*Acacia pycnantha*) from one to two chains wide. After a few years the bark from these will be a valuable asset. The trees for the orchard should be specially selected for quality, and also for profit if any are to be raised for sale. It is advisable to grow some to be dried for use when the season for fresh fruit is over, and a good supply of long-keeping apples should be provided for. Grapes ripen too late to allow of much raisin-drying, but evaporators can be made, or purchased at a moderate price, by means of which sufficient fruit of all kinds can be dried for home consumption. A windmill and pipes for distributing water to all parts is necessary, even in this part, for we often suffer for want of water in our gardens during spring. As land is abundant, the trees should be planted widely, to allow of a horse being used in cultivation, thus decreasing the labor. Almonds and walnuts grow well here, and could be used as windbreaks. They are prolific, and the nuts sell at good prices. Stables should be warm and well ventilated, and be open to the eastward, because horses that are kept in closed stables are apt to catch cold when occasion arises to turn them out into an open paddock after a journey from home to a place where no close stable is available. Cows and fowls should have their sheds and shelters, and both should be well fed in order to make them give good results. Pigs should be kept, and small paddocks fenced pigproof for them to run in. Some land should be heavily manured for the purpose of growing green food for them. Each paddock in which pigs are placed should have styes provided. Cows will pay well if there is a good supply of green fodder for the winter months, otherwise they must be fed at that time with chaff and bran. Owing to low price of wheat, it pays better to grow oats in the South-East. If a large area of barley is grown it swamps the market. Sheep should be kept according to the nature of the country. If it is rough the Merino is best, but on rich land the coarser breeds with large frames will be better, as they fatten quickly and the lambs are sought after for freezing. Shelter belts of trees or tall-growing hedges should be planted around all boundaries to protect the crops and stock against bleak and prevailing winds. This would prove beneficial to the crops and stock, and add very considerably to the beauty of the landscape. Belts of golden wattle planted along boundaries will serve the purpose, and can be permanently maintained if the stripping for bark is not all done at once. Any useless trees, such as honeysuckle (*Banksia marginata*) or teatree (*Melaleuca* species) should be ringbarked, and then burned when dry enough. Some holdings have thus been enabled to double the number of animals depastured thereon. Owing to the

fluke, various worms, and other parasites attacking sheep which depend upon swamp waters, it is recommended to sink wells and erect windmills to pump water into stone-built cemented troughs. This would very considerably diminish the trouble under the head of parasites.

Mr. B. A. Feuerheerdt said African boxthorn is a soil robber, and gives harbor to birds and vermin. He preferred tamarisk (*Tamarix gallica*) or tree lucern (*Cytisus proliferus*), or tagosaste (*Cytisus palmensis*). Mr. Newman said he had destroyed a hedge of boxthorn because it robbed the soil and gave harbor to sparrows. Nothing would grow near the hedge. Mr. Langberg favored poplars, which have an upright growth, and are not good shelter for sparrows on that account. Mr. Riddoch had planted many kinds of trees, principally pines, but his land was wet, and they had not succeeded. Nature had provided him with a beautiful shelter in the indigenous redgum tree (*Eucalyptus rostrata*). They sprang up all over his paddocks during a wet season, and he cut them all down except around the boundaries. They were very handsome, provided excellent shelter, and he was proud of them. He would have preferred pines, on account of their valuable timber, but the eucalypts had proved the best for the situation. Mr. B. A. Feuerheerdt would like to see *Cypressus macrocarpa* used for hedges where it will grow. He had seen a hedge of this 20ft. high and like a wall. Mr. Hall held to his opinion concerning boxthorn. If well kept nothing could go through it.

FISH.—Members propose to take steps to introduce suitable fish into the permanent waters of the district.

EXHIBITS.—The Chairman showed interesting samples of wool from New South Wales, also Bradford tops and Cape tops.

Crystal Brook, January 5.

Present—Messrs. J. C. Symons (chair), W. Hamlyn, R. Pavy, A. Hamlyn, P. Davy, W. Natt, G. Davidson, W. J. Venning, and F. S. Keen (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. R. Pavy tabled samples of Ranjit wheat; the sample was fair, but not equal to Early Show grown under same conditions. Other varieties received from Central Bureau were failures, blighting off with the hot winds. Mr. W. Hamlyn tabled four varieties, all being manured. Marshall's Hybrid was the best, Ranjit, Silver King, and Majestic not having filled well. Mr. A. Hamlyn showed the varieties in the straw and grain. Ranjit was best, Marshall's Hybrid being next. None of them were equal to Carmichael's Eclipse or Durt's Imperial grown under same conditions. Mr. Natt obtained 6½lbs. of Ranjit from 4ozs. sown; 5lbs. Majestic from 4ozs.; 5lbs. Silver King from 4ozs.; and 4½lbs. Marshall's Hybrid from 4ozs. Mr. Venning tabled a large sheaf of each variety, Ranjit being the tallest. Silver King and Marshall's Hybrid were the best for grain. He was of opinion that Ranjit would be a good hay wheat. All the varieties were worthy of further test, and under more favorable conditions would, he believed, prove good kinds. Mr. Venning tabled sheaf of Allora Spring wheat, a splendid sample; but the plant was inclined to go down.

SEED WHEAT FOR DISTRESSED FARMERS.—It was resolved that this Branch sympathise with the farmers who have failed to secure a crop, and will assist by each member contributing one or more bags of seed. The Chairman stated that the local council was taking the matter up, and that the wheatbuyers had been asked to collect from the farmers as they deliver their wheat.

GLADSTONE CONFERENCE.—Representatives were appointed to attend Annual Conference of Northern Branches, to be held at Gladstone on February 13.

Gladstone, January 5.

Present—Messrs. W. A. Wornum (chair), J. Rundle, C. Gallasch, J. Shepherd, J. Gallasch, J. Burton, G. M. Growden, J. Milne, and C. Goode (Hon. Sec.).

USE OF FERTILISERS.—Mr. Rundle said he had obtained better yields where he had used 70lbs. Lawes' super. than where 120lbs. had been drilled; and with Globe manure no difference was discernible between plots treated with 120lbs. and 70lbs.; but where no manure had been used the crop was very poor. Mr. J. Shepherd could see no difference between plots sown with 60lbs. and 70lbs. respectively of super., the yield in each case being just under 23bush. per acre; but where no manure was used the yield was not half so much. Mr. Burton divided a field into three strips, drilling the centre strip with 70lbs. super., and sowing all with the one kind of seed under exactly similar conditions. The return from the centre (manured) strip was 18bush. per acre, and from the outside (unmanured) strips was 12bush. Members concluded that from 60lbs. to 75lbs. superphosphate per acre is sufficient in this locality. [It is very possible that the yield per acre may be governed as much by the amount of readily available potash and nitrogen as by the quantity of phosphoric acid. If either of the three above-named substances is not sufficiently abundant for the necessities of the crop, the yield will be limited by the quantity that is available.—GEN. SEC.]

DEFOLIATED VINES.—Mr. G. M. Growden stated that his grape vines were losing their leaves, and the bunches of newly-formed grapes were fully exposed to the scorching influence of the sun. He wants to know the reason and remedy.

Wilmington, January 7.

Present—Messrs. J. Hutchens (chair), M. Gray, J. McLeod, W. Slec, H. Noll, J. Schuppan, J. Lauterbach, and R. G. S. Payne (Hon. Sec.).

CONFERENCE AT QUORN.—Delegates were appointed to represent the Branch at Conference of Branches to be held at Quorn on February 15, and papers on "Dairying" and "Rabbit Destruction" were promised.

ATTENDANCE.—It was resolved that all members who have been absent for three consecutive meetings be informed that unless present at next meeting their names will be struck off the roll.

WHEAT EXPERIMENTS.—Mr. Noll reported on experiments with wheats received from the Branch. Steinwedel produced 14½bush. per acre, the grain being a little pinched; Majestic was much pinched, and gave 11½bush.; Ranjit, slightly pinched, 11½bush.; Californian Purple Straw, grain plump, yield 15½bush.; Bluey, very plump, 11½bush.; White Tuscan, fairly plump, 9½bush.; Ceres, pinched, 9½bush.; Accessit, pinched, 9½bush.; Gallant, very good, 8½bush. Mr. Noll also reported on experiment with English super. Fifty-five acres drilled in with 60lbs. mineral super. per acre averaged 25bush., and ten acres broadcasted unmanured on adjoining field gave 8bush. per acre less. The Hon. Secretary reports that so satisfied are the farmers in the locality of the utility of the seed drill and the value of commercial fertilisers that a number will put in portion of their crops with the drill this year.

BIRD PESTS.—Mr. Gray reported that the first flock of starlings he had noticed in the North had visited his garden recently.

RABBIT DESTRUCTION.—Discussion took place on this subject. The members were unanimous that the poisoning of rabbits was cheap, simple, and effective, but concerted action on the part of all owners of infested land was necessary.

Carrieton, January 10.

Present—Messrs. J. B. Harrington (chair), M. Manning, A. Steinke, F. Kaerger, and J. W. Bock (Hon. Sec.).

CONFERENCES.—Some members promised to attend Conferences of Northern Branches to be holden at Gladstone on February 13 and at Quorn on February 15 next.

SEED FOR DROUGHT-STRICKEN FARMERS.—Although crops were very poor in this district, members propose to donate a few bags of seed to the seed wheat fund; and they urge that the seed should be distributed before the 9th day of March, because later sowing in this part of the country is usually a failure.

BEST WHEATS FOR THE DISTRICT.—Members discussed this matter, and concluded that the early-maturing sorts are the safest to sow, as they are not so liable to suffer from late dry and unfavorable weather.

Mount Bryan East, January 5.

Present—Messrs. T. Wilks (chair), John Wilks, W. Bryce, and W. Dare (acting Hon. Sec.).

CHANGE OF SEED.—Agreed, that change of seed occasionally is beneficial.

EXHIBITS.—By W. Dare—Ranjit wheat from Central Bureau seed. Three pounds of seed sown May, 1900, gave 45lbs. in December. The sample was good. Mr. Bryce sowed Majestic seed, which failed through malting in the soil.

LOCUSTS.—The locusts have destroyed all summer fodder.

Johnsburg, January 5.

Present—Messrs. G. H. Dunn (chair), F. W. Hombsch, F. W. Smith, H. Napper, J. R. Masters, T. Thomas, L. Chalmers, and T. Johnson (Hon. Sec.).

RABBITS.—Mr. Hombsch noticed that the rabbits were still increasing in numbers, and urged landholders to use their best endeavors to keep them in check. He advised the use of sulphur and phosphorus in the burrows. Cut the phosphorus into $\frac{1}{4}$ in. pieces and wrap them in a rag with a tablespoonful of sulphur, and place them in the burrows, closing the entrance with loose earth. Flowers of sulphur or rock sulphur should be used; the phosphorus should be cut while in water.

Wilson, January 12.

Present—Messrs. T. Barnes (chair), R. Rowe, W. H. Neal, J. Coombes, and A. Canning, (Hon. Sec.).

HAY.—Paper by Mr. H. A. Davis, of Riverton Branch, on "Hay and Hay-making," as read at Congress, was read, and a good discussion ensued. Many points, particularly in connection with thatching, were brought out, and regret expressed that owing to the bad season and the consequent absence of stacks to thatch they could not be carried out. Members were of opinion that bearded wheats were not so injurious to the horses' mouths as some farmers think, while they have the advantage of giving the heaviest returns in this locality.

Nantawarra, January 2.

Present—Messrs. E. J. Herbert (chair), S. Sleep, A. F. Herbert, G. Belling, E. J. Pridham, R. Nicholls, T. Dixon (Hon. Sec.), and two visitors.

BURNING STUBBLE.—Mr. E. J. Herbert asked whether members favored burning stubble or leaving for stock when the paddock is to be left out for two or three years. Most members favored feeding off, but Mr. Nicholls was not sure that burning was not better, as it was decidedly beneficial to the soil. One season he got much better results from a piece of grass land that was burnt before ploughing than from similar ground where the grass was not burnt; on the latter the grubs were troublesome. The Hon. Secretary thought the ploughing under of the grass might have afforded protection to the grubs. He did not favor ploughing down grass or stubble, as the rainfall was too light for rotting it. When stubble had to be turned under, he had noticed that on ploughing the land up again the following year a lot of the straw appeared in the same condition as when ploughed under. Mr. E. J. Herbert said on some of his grass paddocks the feed had been destroyed in patches. He had searched for grubs and other insects, but had failed to find anything.

Onetree Hill, January 4.

Present—Messrs. F. L. Ifould (chair), A. Adams, F. Bowman, W. Kelly, W. G. Smith, and J. Clucas (Hon. Sec.).

NOXIOUS WEEDS.—Members remarked upon the difficulties and obstacles encountered in all efforts to secure proper enforcement of the Act. In one case cited a district council gave an offender proper notices under the Act, and when he failed to attend to the instructions the council undertook the work; but, on suing him before the Local Court, the case was decided against the council.

RABBITS.—In some quarters rabbits are multiplying rapidly, and it is certain that much damage will result in the absence of combined active effort to cope with them. The kangaroo rats reopen the burrows when closed. Bisulphide of carbon has been successfully employed in a few cases. Phosphorised pollard, though successful, does not meet with universal approval, on account of its intensely cruel action on the rodents as well as upon numerous valuable insectivorous birds which usually take a large number of the baits.

HARVEST.—Returns of 20bush. and upwards per acre have been almost the rule in this locality; the exceptions prevail where fallowing and fertilising have been neglected.

Wandearah, January 8.

Present—Messrs. Geo. Robertson (chair), J. Wall, W. Roberts, E. Jacobs, W. Munday, W. J. Fuller, E. H. Eagle, A. W. Davidson, L. Stanley, and C. Birks (Hon. Sec.).

MAIZE.—Mr. Jacobs tabled maize in ear, 6ft. high, from a small crop grown on flooded land.

FARMERS' UNION.—In an animated discussion several members advocated the necessity for active and consistent support of the Farmers' Co-operative Union.

FAVORED WHEATS.—The varieties of wheats most favored here are King's Early, Early Para, Purple Straw, Eclipse, Gluyas, Scotch Wonder, Smart's, and Marshall's No. 3.

Wandearah, December 3.

Present—Messrs. G. Robertson (chair), J. Wall, W. Roberts, T. Joyce, E. Jacobs, W. Munday, W. J. Fuller, E. H. Eagle, A. W. Davidson, L. Stanley, and C. Birks (Hon. Sec.).

EXHIBITS.—Mr. W. Munday tabled four samples of wheats raised from Central Bureau seed, all sown at one time under equal conditions. Two ounces of seed were sown in each case. Ranjit yielded 4lbs. 6ozs., and is weak stemmed, liable to go down, but ripened ten days earlier than the rest, did not stool much, and was a good sample; Majestic gave 5lbs. 8ozs., stooled well, and was a good sample; Silver King gave 4lbs. 14ozs., stooled well, and was a good sample; Marshall's Hybrid gave 6lbs 6ozs., of rather inferior sample. Other members reported similarly.

CROPS.—Most of the members are of the opinion that manured crops gave the best sample of grain, and that they matured eight to ten days earlier than those not manured. It is estimated that the average of the district is 8bush. of wheat per acre, and 15cwts. to 18cwts. of hay.

Forster, January 8.

Present—Messrs. J. Johns (chair), W. Johns, F. Johns, John Johns, J. Sears C. Bolt, J. Retallack, J. Prosser, and E. Schenscher (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. J. Retallack sowed 4ozs. Silver King wheat and harvested 5½lbs.; 3ozs. of Ranjit gave 4½lbs.; 3ozs. Marshall's Hybrid gave 3½lbs.; and 4½ozs. Majestic gave 9lbs

SACKS.—Members generally favor the system of borrowing cornsacks and selling wheat at net weight.

Watervale, January 7.

Present—Messrs. G. Hunter (chair), H. Beck, G. Holder, S. Solly, J. Thomas H. Scovell, and E. Treloar (Hon. Sec.).

EXHIBITS.—Mr. Hunter tabled prairie grass and another, of which the name is unknown, but which seems to be of great value for suitable localities. Mr. S. Solly tabled good sample of early Strawberry apple and Angelina Burdett plums. Mr. E. Treloar tabled Montgamet apricots, Early Orleans plums, and Red Astrachan apples.

SHOW.—The Annual Branch Show was fixed to take place on March 6.

Strathalbyn, January 14.

Present—Messrs. M. Rankine (chair), D. Gooch, A. Rankine, W. J. Tucker, H. H. Butler, Geo. Sissons, R. Watt, and J. Cheriton (Hon. Sec.).

HARVEST RESULTS.—Discussion took place on the late harvest, how grown, and results. Mr. Sissons stated that the crops in his neighborhood were good, and much benefit had been derived from artificial manures. He considered Purple Straw the most favored wheat for the hills. Mr. Watt had used bone-dust with good results, and considered Bluey was the best variety for that district. Mr. Butler reported satisfactory results from the use of manures. Mr. Rankine considered King's Early the best wheat for the plains if sown on sandy soils with from 60lbs to 70lbs. super. The crops on the plains were fair; but manure did more harm than good on the hard land, as there had not been

sufficient rain to bring them to maturity. Mr. Tucker had used Thomas phosphate and Bally bonedust, mixed in equal quantities, on a crop of flax, and reaped 3 tons per acre; his wheat crops are also good. Bluey, he considered, was the best variety of wheat for the district. It was the opinion of the members that the drill and artificial manures were really necessary to secure a crop on the wheat-sick lands of the district.

CONFERENCE OF SOUTHERN BRANCHES.—It was resolved that the Ninth Annual Conference of Southern Branches be held on Friday, March 22.

Appila-Yarrowie, January 17.

Present—Messrs. P. Lawson (chair), J. C. F. Keller, J. Wilsdon, J. H. Bottrall, N. Hannagan, E. Catford, W. C. Francis, and C. G. F. Bauer (Hon. Sec.).

GLADSTONE CONFERENCE.—Several members promised to attend the Conference of Lower North Branches, to be holden at Gladstone on Wednesday, February 13.

HOME INDUSTRIES.—The Appila-Yarrowie Show of home industries was fixed to take place on February 27.

Cherry Gardens, January 19.

Present—Messrs. C. Lewis (chair), T. Jacobs, H. F. Broadbent, G. Lewis, G. Brumby, E. Wright, A. Broadbent, and C. Ricks (Hon. Sec.).

SHOW.—A show of produce and industries in connection with this Branch was fixed to be holden on March 21.

FRUIT CARS.—Members are of opinion that special cars for the conveyance of fresh fruit upon the railways would be of great benefit both to growers and consumers, besides bringing profitable traffic to the railways.

Elbow Hill, January 8.

Present—Messrs. H. T. Styles (chair), E. Wake, W. N. Beinke, W. Ward, C. G. Ward, W. Spence, H. Dunn, J. Elleway, F. J. Brooks, J. Harvey, W. Crook, J. Rehn, G. Wheeler (Hon. Sec.), and two visitors.

EXHIBITS.—Mr. Ward tabled Ranjit wheat, which he reports to be very early, and thinks is a valuable variety for this district. Mr. Spence tabled sample of Silver King wheat, very poor grain, and too late for this locality. Mr. Harvey said Marshall's Hybrid is a very early wheat, with plump grain, and appears to be excellent in every way. The Hon. Secretary reported Regent a very late wheat, which dried off before the heads formed. Messrs. Wake and Elleway both spoke very favorably of Petatz Surprise wheat, which they think will be largely grown in the future.

CO-OPERATION.—It was decided to co-operate in sending a fairly large order for dried fruits to one of the southern Branches of the Bureau. [I suppose this means that a member of some Branch in the fruit-growing districts will receive an order. The Branches are not storekeepers or tradesmen, but each member in his private capacity may be either or both.—GEN. SEC.].

FERTILISERS.—The Chairman read the following paper on his "Experiences with Seed and Fertiliser Drill":—

Three years ago I drilled sixteen acres with $\frac{1}{2}$ bush. of wheat and about 80lbs. Thomas phosphate to the acre, as late as August, and got a return of 6bush., fair sample. This paddock has since been sown broadcast with $\frac{1}{2}$ bush. seed, ploughed in early, and given $1\frac{1}{4}$ tons hay for seven acres cut, and eighteen bags wheat for nine acres reaped, for each of the two years. This is light loamy land with clay subsoil. Of fifty acres similar land, treated two

years ago with 80lbs. Thomas phosphate, has also given a return of 8bush. to the acre. I noticed the first year the drill when started sowed the wheat but not the manure for about two chains, and if the crop in that portion could be taken as a sample of the whole without manure, I can say I should not have gone to the trouble and expense of reaping it. Last year I cleared forty acres of wallaby and broom bush; a light sandy soil, considered inferior and third-class land. I sowed half with 80lbs. Thomas and half with super. The super. forced the plants from start to finish, was ripe when that sown with Thomas was green. I cannot say which gave the best results, but I got a heavier crop off this inferior land, as when I include ten acres not yet treated with manure I find myself with an average of 10bush. from 100 acres sown, as cleaned up from the one heap. As the manure seems to have given me as good a return the third year as the first, the following questions occur:—Does it take three years for the land to absorb it? Does the sandy soil absorb it quicker, through holding the moisture better than heavier soils? Why does it give better returns, although, apparently, hungry, poor land? Should we sow early or late? Can we increase the manure?

Mr. Beinke said he had used phosphates for two years, and found that he got a heavier yield the second year from land that had been fertilised once only. He thought that heavy applications of superphosphate would cause too strong growth, and that this would blight in the end. Mr. Brooks thought sandy soils, being more moist, caused a more rapid solution of the fertilisers, and consequently results were quicker. He had reaped 10bush. per acre this season from manured land, and anything from 2bush. down to nothing from land unmanured. Members generally believe that from 50lbs. the 60lbs. of super. per acre is sufficient to drill in with the seed. Mr. Ellery had good results from drilling sheep manure.

Finniss, January 14.

Present—Messrs. J. Chibnall (chair), W. W. Heath, A. Green, T. Collett, S. Collett (Hon. Sec.), and one visitor.

DESTROYING RABBITS.—Mr. J. Chibnall read the following paper:—

Members have doubtless noticed the increase of rabbits in this locality during the past year, and it is necessary to adopt repressive measures before they completely overrun the country, eating all our grass and crops. There are several methods of keeping them in check—poisoning, wire netting, shooting, and trapping. With regard to wire netting I do not think it quite satisfactory, as the rabbits have been known to climb over if they cannot burrow beneath, and the wire netting does not last good more than ten years except in dry country. Phosphorised pollard, &c., will reduce them as quickly as any known method, but it has its disadvantages, danger of fire, killing numbers of our useful birds, opossums, &c., and cattle chewing the rabbit bones, with the result the cows being killed. Toxa does not prove very satisfactory in this part of the district, and is only of use to put near a rabbit warren containing very young rabbits that do not travel far from the burrows. Shooting and trapping both require skill and experience to prove satisfactory.

If the rabbits have burrows I have found the bisulphide of carbon to be most satisfactory, and if followed up will get rid of the rabbits without destroying any useful birds. This can be bought in ½gall. tins, costing about 8s. 6d., and is handy to carry, more economical than buying in 5gall. drums, as it evaporates very quickly if exposed to the air. My method is—get 2lbs. of cotton waste, which will be enough for ½gall.; this quantity of bisulphide will do about 300 holes. Make a pair of tongs about 3ft. long from a piece of hoop iron. Pour about half a teaspoonful of bisulphide on the cotton waste and put into the burrow with the tongs. Do not let the cork remain out of the tin longer than you can help. Fill up the burrow quickly airtight, and in about three minutes—if the burrow is not too deep—you will hear the rabbits sneeze; you may rest assured that the bisulphide is doing its work. Instead of cotton waste I have used old pieces of flannelette tied to a stick about 3ft. long. Where you can get sticks and tie on cotton waste I find more satisfactory than tongs, as with tongs you are liable to bring out the cotton waste when withdrawing the tongs.

Every one having rabbits burrowing on their property should make it their business to use bisulphide, and follow it up for the next three months—as the rabbits have stopped breeding except where they can get green feed for their young ones—otherwise we shall not be able to keep half the stock we should do, as the rabbits eat all the crown out of the feed, and one only has to take note that a property carrying rabbits will not fatten stock satisfactorily.

Gawler River, January 4.

Present—Messrs. J. Badman (chair), J. Hillier, R. Badcock, F. Roediger, J. Barrett, J. S. McLean, A. Bray, and H. Roediger (Hon. Sec.)

"WHEAT-STEM KILLER."—The Hon. Secretary reported having sent diseased wheat plants to the Central Bureau. The General Secretary had forwarded the same to Mr. D. McAlpine, Victorian Government Vegetable Pathologist, who found that the plants were attacked by a fungus parasite apparently identical with that known in Europe as "the wheat-stem killer." Mr. McAlpine recommended the ploughing under or else burning of the stubbles. Several members had noticed a similar disease in their crops, both in the latest and in former seasons, and on various kinds of soil.

EXHIBITS.—The Hon. Secretary tabled three varieties of wheat. Marshall's hybrid, medium early, yielded at the rate of 21bush. per acre, but its character is not yet "fixed," since there were three or four varieties in it. Ranjit is a medium early sort, yielding at the rate of 20bush. per acre, grew over 5ft. high, is a good sort for hay. Silver King yielded at the rate of 19bush. per acre, and seems to be the best of the three, being a good milling wheat, but rather late. Majestic was rather too late a sort, gave too much scope to weeds, and was cut for hay.

EFFECTS OF FERTILISERS.—Mr. F. Roediger said he had got the best results by using three parts bonedust to one part mineral super., mixed and applied at the rate of 1½cwt. per acre. The yield was up to 28bush. per acre, and was better than where super. or bonedust were used separately and alone. Mr. McLean said he had got better results from Lawes' super. than from Alkali Co.'s super.

FOWL TICKS.—Mr. Badcock has lost a number of fowls through attacks of *Argas reflexus*. He was recommended to swab the fowls beneath the wings and thighs with kerosine. Insect powder was also recommended. [The ticks are about the roosting places, and will live there for years, even though no fowls are kept there. Swab the fowls once a week as above directed, and remove them altogether from the old fowl house or wherever they now roost.—GEN. SEC.]

Naracoorte, January 12.

Present—Messrs. S. Schinckel (chair), J. Wynes, E. C. Bates, G. Wardle, and A. Johnstone (Hon. Sec.).

GORSE AS FODDER.—Mr. Rowland Campbell, of Millicent Branch, wrote forwarding numerous evidences of the value of gorse as fodder. In New Zealand one landowner sowed gorse on ridges 4ft. apart, on land that was next to worthless, and was then enabled to fatten six sheep per acre. Another, whose land would carry only 300 sheep, sowed gorse and was enabled to keep 2,000 on it. The young shoots of the gorse are kept down and fresh growths continually spring up. The sheep will not touch the gorse until they are very hungry, but when they do begin to eat it they like it, and it is very nourishing. In discussing Mr. Campbell's letter it was stated that small patches of gorse or whin were growing by the roadsides in the district, and there are considerable quantities in the Mount Lofty ranges near Adelaide, but no animals attempt to eat it. This was due to the age of the plants and the fact that there is always plenty of other feed. Sheep in New Zealand [and in Europe also—GEN. SEC.] eat the young plants with avidity when once they have become accustomed to it, but cannot eat the old thorny growth. Mr. A. Johnstone remarked that there are three varieties; one was double-flowering, and usually grown as an ornamental plant. On the Millicent Road the rabbits keep the gorse from growing large. Mr. Wardle stated that this plant will thrive on white sand.

EFFECT OF FERTILISERS ON GRASS.—Mr. F. Krichauff (Chairman o. Central Bureau) wrote asking if members had noticed any beneficial effect on grasses growing on land after the removal of a crop which had been fertilised. Mr. Johnstone did not consider "artificial" manures increased the grass—they gradually sterilised the land. Mr. Bates did not think so; certainly bonedust greatly improved the land. Mr. Johnstone said bonedust is not an artificial manure. Manures are organic and inorganic. The organic manures build up a soil; inorganic manures sterilise it. Mr. H. Smith had found that grasses were greatly improved after the land had been fertilised with commercial manures [It is quite true that bulky manures, such as "farmyard," will build up as well as enrich a soil; but it is absurd to say that the addition of plant food to the soil lessens the quantity of plant food in that soil—otherwise "sterilises" it. Of course the addition of any ingredient that was before deficient enables the plant to use up substances that were present in the soil in sufficient quantities, and thus a heavier crop is produced than was possible before. With that heavier crop an additional portion of *every* substance required in production of that crop is removed from the soil, and to that extent the supplies of plant food are diminished. Exactly the same results would follow the application of farmyard manure; but in this there is, in *addition* to the one deficient ingredient, say, phosphoric acid, further supplies of, say, potash and nitrogen, which were not urgently required for the full development of the crop. Where super. or bonedust alone is applied to land continuously, there will in time be a deficiency of potash and nitrogen in the soil, because those substances have been continuously removed with each successive crop.—GEN. SEC.]

FEED FOR HORSES.—The Chairman said there was a question which was interesting to Branches, and that was whether whole oats or crushed oats was the best feed for horses in comparison with bran and oats. He thought everything was in favor of oats; the bran was used principally as a laxative, and the difference in expense was not much. Mr. Wynes had a good deal of experience in feeding horses doing constant hard work, and he would not attempt to use bran only. He preferred crushed oats fresh to whole oats. They should be crushed twice a week. Pollard was good so far as keeping horses in condition was concerned, but it had a tendency to gripe horses. He found that horses did better on oats than any other kind of feed. He had also found boiled barley good.

IMPACTION OF THE OMASUM.—Mr. Wardle reported he had two milking cows that recently died. Mr. Inspector Williams made a post-mortem on one of them and found that it had died from severe impaction of the omasum. It was one of the worst cases he had come across. The stuff he found in the cow was compressed as hard as a cake of tobacco, and of a black-brownish color. This state was not the result of a few days or weeks, but the impaction had commenced last season, and when the animal started to take dry feed again the animal had succumbed. Some people thought it was a disease, but there was no doubt that his cows had died from impaction. Mr. Bates was still of opinion that it was a disease, that little was known about it yet. Mr. Wardle said that they had to give their cattle succulent feed during summer. Mr. Wynes thought it was caused by the dry feed. He thought if they gave their cows a little hay during the spring of the year it would be good preventive. As it was they went too suddenly from green feed to dry feed, and the digestive powers were seriously impaired. Mr. Wardle said that the Inspector recommended as preventive crushed bones, sulphate of iron in the water, and salt. Mr. Bates said that his cows died when feeding on green feed, so that he failed to see it was the dry feed. Mr. Wardle said the impaction had set in the previous year.

EXHIBITS.—The Chairman then showed samples of potatoes he had grown from seed imported from Germany by Mr. Krichauff. They were named as follows:—Professor Korn, Ehlers (a large potato), Wahlmann (fair size), Thiel (a very heavy crop—good potatoes), Professor Maercker. He also showed some raised from seed known as Queen of the Valley, which he received from Mr. R. Campbell, of Millicent. He also showed samples raised from seed named Blue Manhattan, Early Dean, Fidler's Riding Giant, and White Hollander. All the samples of potatoes shown were good, except White Hollander, which was yellow and soapy looking. He showed samples of Red Withersfield onions raised from Bureau seed; it had had a hard struggle for life. Seed from All-the-year-Round lettuce, which had been raised from Bureau seed, was tabled for distribution. The Chairman said he had experimented with broom grass, saltbush, and Florida velvet beans, and had met with no success.

Mallala, January 14.

Present—Messrs. G. Marshman (chair), H. B. Moody, S. Temby, A. F. Wilson, J. Jenkins, A. Moody, G. W. Bischof, R. Butler, M.P., and W. R. Stephenson (Hon. Sec.).

HARVEST.—A short discussion took place on the harvest. It was agreed that the district would average about 14bush. per acre.

WHEAT EXPERIMENT.—Mr. S. Temby tabled sample of Majestic wheat from Central Bureau seed. From 1½lbs. seed he reaped 23lbs. of grain on land manured with super. The sample was, however, much pinched, but he intended to try it again this year.

VISIT TO HOMESTEAD.—On January 22 all but one of the members and several visitors met at Mr. A. Moody's farm to see his header at work. A good crop of Dart's Imperial wheat had been cut and stacked, and was now being put through at the rate of about 40 tons daily. The sample of grain was exceedingly good, and the method of harvesting and preserving the straw came in for very favorable comment. Luncheon was provided by Mr. and Mrs. Moody, and afterwards the farm of Mr. S. Temby was visited. Here the products of the orchard were sampled, and at the conclusion of the visit afternoon tea was provided by Mrs. Temby. During the day many points of practical interest came under notice, and the outing was greatly enjoyed.

Balaklava, January 12.

Present—Messrs. P. Anderson (chair), C. L. Reuter, A. Manley, A. W. Robinson, J. Vivian, A. Hillebrand, G. Reid, and E. M. Sage (Hon. Sec.).

EXPERIMENTS.—Mr. Reid drilled Silver King wheat (received from Central Bureau) on April 21 with 40lbs. super. per acre. It stood well, creeping close to the ground, being about 4in. high when Steinwedel and Newman were 15in. high, but it rose to 3ft. 9in., and gave 85lbs. from 3lbs. sown. There were several bearded plants amongst the crops, but these were pulled out before reaping. He considers it a first-rate wheat to sow early as it ripens about a fortnight later than Steinwedel. Mr. Thompson made his pickle too strong for the seeds of Marshall's Hybrid, and only a few plants grew.

EFFECTS OF COMMERCIAL FERTILISERS.—The question arose as to whether phosphatic manures caused wheat crops to blight during last spring. Mr. Robinson said that at the college Professor Lowrie used up to 2cwt. per acre, and whilst he was there he saw no crops were blighted. He himself had used 1cwt. per acre last year, and had obtained an all-round average of 18bush. per

acre. Mr. Reuter said that in one of his paddocks there was a rich-looking black flat that he considered good enough without manure, so he told the men to shut off the manure when crossing it. As an experiment one width of the drill was manured, and the crop there was splendid, whilst the unmanured part was all blighted. Mr. Reid said that in the first paddock he sowed he used only 40lbs. manure to the acre; the yield was not as good in proportion as it was on a paddock sown later with 70lbs. manure, although the straw was stronger in the first paddock. The Hon. Secretary thought a fault generally existed in not using enough manure to carry the plant through the season. Most people about here used only 40lbs. to 60lbs. per acre. He had used up to 2cwts. per acre on small areas, and had not seen any of it blighted. The last season he used 1½cwt. per acre on newly-ploughed land, sown late in June, and some of that was blighted. One part sown with 25lbs. of experimental wheat had returned nearly three bags. Members thought that the stage of growth of the wheat plant was in when the hot spell came on had more than anything else to do with the blighting of the plant.

Lipson, January 5.

Present—Messrs Chas. Provis (chair), H. Brougham, R. B. Haldane, W. F. Darling, Jas. Brown, Jas. McCallum, S. F. Potter, Geo. Carr, E. J. Barraud (Hon. Sec.), and two visitors.

WHEAT EXPERIMENTS.—Mr. Carr tabled samples of wheat grown from Bureau seed. Ranjit was sown in two drills 32ft. long, and yielded 2½lbs. seed. Silver King, on same area, gave 2lbs. 6ozs. Marshall's Hybrid, from 30ft. of drill, gave 1lb. 6ozs., and Majestic, on same area, 1lb. Ranjit was worthy of further trial in this district. Mr. Darling tabled nice sample of Steinwedel wheat from land manured with mineral super.

OATS FOR PIGS.—The Chairman asked whether oats could be grown profitably for pigs.

Mount Gambier, January 12.

Present—Messrs. J. Watson (chair), J. Dyke, W. Barrows, T. H. Williams, M. C. Wilson, J. Kennedy, D. Norman, A. J. Wedd, T. Edwards, J. C. Ruwoldt, W. Bodey, and E. Lewis (Hon. Sec.).

INSTRUCTION ON STOCK DISEASES.—In reply to question, Stock Inspector Williams said he had nothing further say in regard to this matter. He was willing to start a class of, say, twelve young men, and to take up chiefly the diseases of stock, the necessity for cleanliness in the dairy, and similar matters. There would be no charge made, and the class would be held at his residence on Saturday evenings. It was decided that the Hon. Secretary take names of intending members, and that the class be formed as soon as sufficient names have been handed in.

STOCK ASSURANCE.—Mr. Williams suggested the establishment of a stock assurance fund, from which compensation could be paid to those who had their animals destroyed on account of disease. He believed if the owners of dairy stock in the district would contribute 1s. per head per annum they would soon have enough to pay all ordinary demands upon the fund. He went on the assumption that not more than 2 per cent. of the herds were diseased. It would be a great boon to the poorer stockowners, and would not be a heavy tax on anyone. Several members thought the suggestion a good one, but some doubt was expressed as to whether 1s. per head would be enough. Government assistance was also suggested by some members, and it was decided that Mr. Williams bring the matter forward in a definite way at next meeting.

BOTFLY.—In reply to Mr. Wedd, Mr. Williams said the botfly was now pretty general in the district. He advised farmers to keep their horses short clipped, and to apply kerosene to the parts where the eggs were usually deposited. It was quite true, as stated in the *Journal of Agriculture*, that the bots did not actually kill the horses, but they were a great nuisance, and aggravated other troubles. Mr. Dyke said the botfly was over nearly all the Mil Let district.

CRUSHED OR WHOLE OATS FOR HORSES.—Chairman asked members' opinion on the question raised in the January issue of *Journal* as to best feed for horses. Mr. Wedd's experience was that if whole oats were fed with plenty of chaff the horses would masticate them well, and did well. If the oats were fed whole by themselves too much was swallowed and not digested at all. He thought crushed oats preferable. Mr. Dyke preferred crushed oats, though whole grain fed with bran was a good food. Mr. Williams believed it was always better to use crushed oats. Mr. Barrows considered uncrushed Algerian oats with chaff good. Mr. Ruwoldt had fed Calcutta oats with straw chaff to his horses during past two years, with very satisfactory results.

Pine Forest, January 8.

Present—Messrs. R. Barr, jun. (chair), W. H. Jettner, J. Phillis, A. Mudge, A. Inkster, G. Inkster, J. Flowers, F. Masters (Hon Sec.), and visitors.

HOMESTEAD MEETING.—This meeting was held at the residence of the Chairman, at Bews. Mr. Barr tabled a capital exhibit of fruit grown by himself. The garden is on the southern slope of a sandhill, and surrounds the homestead, making a very pleasing picture. When first planted his neighbors prophesied failure, but the trees still thrive, while gardens planted about the same time on the flats in the district have succumbed. Plums, nectarines, grapes, peaches, and other fruits were doing well without any irrigation.

WHEAT EXPERIMENTS.—Mr. Mudge tabled samples of Ranjit wheat, the grain being much pinched.

CALCUTTA OATS.—Mr. Phillis wished to know where he could obtain seed of Calcutta oats. [Try J. C. Ruwoldt, Mount Gambier.—GEN. SEC.]

WHEAT FOR DISTRESSED FARMERS.—Mr. Barr appealed to members to support the movement for supplying seed wheat to those farmers who, through the drought and the ravages of locusts, had again failed to reap any return for their year's work. There were few farmers in the Lower North and South who could not spare a bag or two of wheat.

MANURING.—Discussion on experiences with manures took place. Messrs. Phillis and Jettner were convinced it was absolutely useless to put in crops now without manuring the land. They would never sow without, but would rather rest the land and turn their energies to some other work. Mr. Jettner had noticed most difference in the yield on the late-sown crops. So far as broadcasting the seed and drilling in the manure, as compared with drilling in seed and manure together, both had failed to notice any difference in the returns, and for hay they preferred the seed broadcasted. Mr. A. Mudge's experience was the opposite, and he would always drill seed and manure in together. Mr. Barr had tried a number of experiments, and found it pays well to use manures. He believed that for their soils the most economical and effective dressing was 56lbs. mineral super. per acre. The low average rainfall to a large extent governed the quantity it was advisable to apply. In regard to different brands he thought farmers had nothing to fear so long as the merchants kept the stuff up to their guarantee of 36 per cent. water soluble phosphate. He knew of one farmer who was going to convince his neighbor that

he could, with good cultivation, produce as good a crop as the other could with manure. The result, however, was 6bush. per acre in favor of the manured crop. Mr. Barr would drill in both seed and manure together.

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the past year eleven meetings had been held, with an average attendance of six members. Only one paper had been read, but numerous matters of practical interest had been discussed.

OFFICERS.—Messrs. J. Phillis and R. Barr, jun., were elected Chairman and Hon. Secretary respectively for ensuing year, the retiring officers being thanked for their services.

Lyrup, January 15.

Present—Messrs. A. Menzies (chair), P. Brown, T. R. Brown, D. Thayne, W. H. Walling, A. Weaver, J. Sykes, W. Healy, D. J. Tree, W. H. Wilson (Hon. Sec.), and two visitors.

RAINFALL.—For December, *nil*. For past year, 8·71in.; for 1899, 9·76in.; for 1898, 7·29in. Recorded by the Hon. Secretary.

EXHIBITS.—Mr. W. H. Walling tabled four varieties of onions grown from seed sent up by Central Bureau for trial, sown end of August, planted out November 1, 1900. New Queen seemed to be the best. White Globe was not quite mature; Neapolitan, medium size, very firm; Maggiajola, larger, medium firm. All of good flavor, quite up to description given.

PRUNING KAKI AND WALNUT TREES.—Mr. Pomeroy desires instruction *re* pruning Japanese date plum (kaki) and walnut trees. [Walnuts are seldom or never pruned, but the heavy thrashing with poles to knock off the nuts in Europe is considered to be equal to a heavy pruning. As to kakis, they require similar pruning with peaches, as the fruits are produced on wood of similar age.—GEN. SEC.]

BEE MANAGEMENT.—Mr. Nolan wishes to know if a slip of wax $\frac{1}{2}$ in. in thickness will encourage bees to extend and work upon it. [They might do so; but it is better to get a little comb foundation, and to use a good deal of perfect comb from which the honey has been extracted.—GEN. SEC.]

RAISIN VINES.—Members wish to know if cincturing raisin vines will have the same effect as it does on currants. [Most probably, yes. In Spain it is the practice to cut half through the strig of bunches of grapes when they are nearly ripe. This seems to increase their size and to hasten the drying. This is done only in respect to the bunches intended for finest table raisins.—GEN. SEC.]

HARNESSING ONE BULLOCK.—Mr. Menzies wishes to know how to harness a single bullock to a cart. [I have had no experience in harnessing bullocks, single or otherwise.—GEN. SEC.]

Riverton, January 5.

Present—Messrs. W. Hannaford (chair), J. Kelly, J. Gravestock, M. Nash, F. M. Calf, W. Davis, F. H. Mitton, W. J. Kelly, and H. A. Hussey (Hon. Sec.).

DOUBLING THE WHEAT SUPPLY.—By request of the Chairman the Hon. Secretary read an article from *Harmsworth's Magazine*, showing that some experiments at the laboratory of Minnesota and Dakota, U.S.A., in the crossing of wheats had resulted in an increased yield amongst the best varieties up to 5bush. per acre.

HARVEST.—Chairman said he thought the present season would turn out to be a record for wheat and possibly for hay. He estimated the yield of wheat for the district at 16bush. per acre and $1\frac{1}{2}$ tons of hay per acre.

Members confirmed the statement. Many farmers were cleaning up 16bush., 20bush., and even 24bush. per acre. In some cases the grain is slightly pinched, but as a rule there is a good sample. In nearly every case this improvement is attributable to improved methods and intelligent farming. Seed and fertilisers having been drilled in together, and seasonable rains experienced.

EXPERIMENTS.—Mr. Davis failed with Majestic; but it stood well under Mr. Nash's hands, and produced a small head and grain. Mr. Gravestocks recommended a good trial of Ranjit, which he thought would do well if sown later than he did on May 22.

ORCHARDS AND VINEYARDS.—These are in good condition. Fruit clean and healthy, and no pests of any consequence are present.

STOCK, &c.—No disease in live stock, and they are in good condition. A few fowls have died from some cause unknown.

SEED WHEAT.—The Hon. Secretary has received promises of about thirty bags of seed wheat for northern farmers whose crops have failed

Mount Compass, January 12.

Present—Messrs. R. Cameron (chair), R. Peters, W. Gowling, F. Slater, A. Sweetman, S. Arthur, F. McKinlay, A. J. Hancock (Hon. Sec.), and one visitor.

SEASONABLE OPERATIONS.—Plant potatoes and cabbages; sow seeds of cabbages, &c., turnips, peas, Shorthorn carrots, and radishes.

Port Broughton, January 23.

Present—Messrs. R. W. Bawden (chair), W. Tonkin, G. E. Pattingale, E. Dalby, E. Gardiner, E. Dennis, and J. Barclay (Hon. Sec.).

CONFERENCE.—It was resolved that the Annual Conference of Northern Yorke's Peninsula Branches be held at Bute on February 15, and that all the neighboring Branches be asked to co-operate.

Stansbury, January 12.

Present—Messrs. A. Anderson (chair), P. Anderson, C. Faulkner, H. C. Pitt, and P. Cornish (Hon. Sec.).

HARVESTS.—Members reported farm crops generally gathered in with better returns than for many years past. The fruit crops are a fair average, and the grape crop promises to be a very good one.

Golden Grove, January 5.

Present—Messrs. J. R. Smart (chair), J. Woodhead, F. Buder, W. Mountstephen, H. P. Day, A. Harper, J. Ross, R. Smith, J. R. Coles (Hon. Sec.), and two visitors.

EXHIBITS.—Mr. Smith tabled good samples of Blenheim apricots.

DAIRYING.—Mr. R. Coles read a paper to the following effect:—

Dairying has occupied a great deal of attention of late, and has often been entered upon in many cases because the returns are prompt as soon as work is put into it. Providing all things are equal—that is, individual capacity and locality—dairying is a good line for anyone who is waiting on development in some other branch of agricultural industry. To be successful a dairyman requires energy, common sense, great patience, and good

temper. He must be prompt to recognise the true value of new ideas, and he must have a good reason for all that he does. Punctuality must be his watchword in regard to everything connected with his business, and perfect management of the herd and everything else should be the rule. Where possible the cows should be of a good strain of a dairy breed; but if capital is not sufficient to allow of the purchase of such, the commoner cows can be selected, weeded out, and the herd improved by breeding from good, pure-bred dairy bulls. Dairying can be carried on wherever wheat can be grown, provided there is plenty of good water. He advocated hand-feeding, as it stimulates the cows to look for more. On October 1, 1899, he bought six cows in full milk for £26, and by June 15, 1900, had spent £12 17s. 6d., and allowed £1 for rent. During that time he sold 1,032lbs. butter at an average of 9½d. per lb., and this added to milk used in home—thirty-five weeks at 6d.—brought the total to £40 2s. 3d., or a total profit of £26 4s. 10d. The cost was a fraction over 3d. per pound, and thus about 6d. was left for labor and incidentals. Then there were four calves and the skim and butter milk, which brought the profit up to about £1 per week. The cows were pastured on about thirty acres of good grass and all the green stuff of the garden, with rye and barley, and also maize and hog weed during summer—all run through the chaffcutter—and mixed with the dry ration of chaff, bran pollard, copra cake, and salt. On September 6, 1900, he shifted into a less hilly part, and increased the number of cows to thirteen. By December 31, 1900, 1,155lbs. butter. Whilst the feed was good he gave the thirteen cows each day one bag chaff, 3lbs. pollard, 14lbs. bran, and wetted the lot with 3galls. water in which three handfulls of salt had been placed. When feed began to fall off the ration was increased to two bags chaff, 6galls. water, 1½lbs. salt, 17½lbs. pollard, 32½lbs. bran (put in dry), 2½lbs. copra cake, and ½lb. linseed. Boil linseed and salt in the water, pour some on the copra, rest on chaff, stir well, then add the copra mix well, and when serving the ration add the bran. Some cows require more of this than is needed by the others. Feed in the bails. Wash the udders and teats before milking, using lukewarm water during cold weather, wipe udders with a clean cloth. Milk slowly at first, and increase the speed and finish quickly.

Port Germein, January 5.

Present—Messrs. E. McHugh (chair), J. R. Gluyas, D. Thomson, C. O'Loughlin, H. Kingcome, F. G. Blesing, A. Thomson, and A. H. Thomas (Hon. Sec.)

WHEAT EXPERIMENTS.—Mr. McHugh tabled twenty varieties of wheat grown by himself experimentally. Very few of them were considered suitable for this district; but a few will have a further trial. Early varieties, if sown early, are liable to be nipped by frost, therefore some medium sorts should also be sown. Baroota Wonder gave him the heaviest yield this season. Members reported all the wheats sent by the Central Bureau for trial proved unsuitable for this district.

EXHIBIT.—Mr. Blesing tabled splendid samples of Early Alexander peaches.

Port Elliot, January 19.

Present—Messrs. J. McLeod (chair), J. Brown, H. Green, jun., H. Pannell, W. E. Hargreaves, J. Nosworthy, J. Lovell, R. E. Ulrich, E. Hill (Hon. Sec.), and a number of visitors, including Messrs. Quinn and Summers, from Central Bureau, and six from Mount Compass Branch.

ANNUAL REPORT.—Hon. Secretary reported twelve meetings during the year, with average attendance of eight members. Amongst many subjects discussed were "Best Wheats for District," "Whole or Cut Setts for Seed Potatoes," "Pickling Seed Wheat," "Lambs for Export," and "Licensing of Stud Horses." Papers were read and discussed, as follows:—"Preservation of Implements and Machinery," "Deep and Shallow Ploughing" (selected), "Soils and Manures," "Deeper Ploughing and Better Cultivation," "Grazing," and "Methods of Preparing for Irrigation." There was a deal of discussion on

matters more particularly local, which need not be recorded. A homestead meeting was held at Mr. McLeod's in November, which was instructive and enjoyable. A ballot to decide upon the members who are to hold themselves responsible for leading consecutive monthly meetings will probably lead to a continuance of the interest that has been taken in the past in the work of the Branch.

OFFICERS.—The Chairman and Hon. Secretary were thanked for their past services, and both were reappointed.

SMALL HOLDINGS.—Mr. W. F. Hargreaves read a paper on "How to Make the Best Use of Small Holdings," to the following effect:—

Perhaps the best use to make of a small holding is to combine dairying and poultry-rearing with fruit-growing. Of course the man must have a liking for his work and possess solid business qualifications combined with some practical knowledge of it. There is a common idea prevalent that the man who knows everything about agricultural industries has lived all his life in the centre of a densely-populated city, whilst he who has followed this business all his life often knows very little about it.—[This is meant for withering sarcasm.—GEN. SEC.]—but, as a matter of fact, the man who succeeds as a fruit-grower or in any other rural pursuit must possess a good deal of knowledge of the business, combined with plenty of endurance and courage. He must maintain a constant cultivation of his soil, and continuously destroy all weeds and pests. There are quite a number of orchards between Mount Lofty and here where the weeds cover the ground and where the trees are almost totally neglected. The small holder can have fruit for his household during eight or nine months of the year, besides having plenty for jams, jellies, marmalades, preserves, dried fruit, crystal fruit, and some for sale to the public. He considered poultry to be the most profitable item where there is a small farm or a large garden. After trying nearly all the breeds of fowls during a long experience he had come to the conclusion that the Black Minorca and White Leghorn are the best, or the first cross between them. The latter are good layers and better foragers than the pure breeds. The Wyandottes come next, and lay well if crossed with either of the above. Fowls in an orchard do much good in eating insects in their various stages, and also a lot of refuse that would go to waste. They must be kept clean, have plenty to eat, fresh water, and a dry place to roost in, then there will be plenty of eggs for the family and a reduced butcher's bill. Be very careful not to breed in-and-in and to avoid going beyond the first cross. Purchase good roosters every year. It is much better to pay £1 for a really good rooster and secure good progeny than to pay 2s. or 3s. for a mongrel that will bring useless and unprofitable stock. Wheat and peas are very good food for hens; it is better to crack the peas or wheat. He strongly recommended members and others to read Mr. D. F. Laurie's valuable articles on poultry in the *Journal of Agriculture*. The cross between Indian game rooster and Langshan hen is a nice table fowl, with good weight and heavy laying capacity; they are not prone to sit, but make good mothers. He uses turkey hens for hatching hen's eggs, placing twenty-one to twenty-four under her. Make a small house; make the nest on the ground, damp it, shut the turkey up at night, and next morning she will be on the nest. When the chicks are hatched take away the brood and give her another lot of eggs to sit upon. If well fed she can be induced to sit and hatch clutch after clutch for three or four months. [Is this under the Sweating Act?—GEN. SEC.] The fowl manure is a valuable asset for use in the garden. Ducks are excellent for keeping down the slugs and all kinds of insects, which they are ready to devour either by day or night. The cow will supply milk and butter for the home, and if some of the milk can be sent to the factory there will be a cheque at the end of each month. What with the food materials produced on the small holding and the little monthly cheques coming in from the sale of surplus products, the owner or occupier ought to find himself in fairly comfortable circumstances.

FRUIT FOR EXPORT.—Mr. Geo. Quinn, Horticultural Instructor, addressed the meeting upon this subject. The business of fruit export is far from being overdone. Growers are just beginning to know the varieties that will carry best, and that are favored by consumers; but they must not be altogether guided by the high prices that are occasionally obtained under perhaps exceptional circumstances. It is always best to make haste slowly, and be sure of one step ere we take another. When the difficulties in transit and handling of fruit consigned to West Australia and Broken Hill have been overcome the business with those places will be greatly extended. By and by we may hope that special vans will be provided on railways for conveyance of fruit, and better provision for treatment of fruit in transit to destinations in West Australia. All persons interested in these progressive movements ought to act in concert

to bring them about quickly. But, anyhow, do not allow any fear of overproduction or of glutting the export markets prevent people from planting largely of the varieties of fruit suitable for those markets. He did not think it possible under present conditions to export fresh peaches. A peach mentioned by Mr. Brown as ripening at Easter and keeping good for three weeks later was probably Lemon Clingstone.

Budding.—Mr. Quinn gave a practical illustration of the art of budding, which was very instructive.

Clarendon, January 14.

Present—Messrs. J. Pelling (chair), A. Harper, J. Juers, J. Wright, H. Payne, W. Spencer, W. A. Morphett, J. Piggott, and A. L. Morphett (Hon. Sec.).

CODLIN MOTH.—At previous meeting, held in December, Mr. W. Morphett drew attention to the fact that, in order to enforce the regulations to keep down this pest, more time should be given to the district by the departmental inspectors. It was resolved that two members be appointed to visit the gardens and report at next meeting. Messrs. W. A. Morphett and Piggott were appointed, and they reported that the pest was doing a great amount of damage in many gardens, while several growers, in their opinion, were doing very little to check its course. It was now resolved that Mr. G. Quinn, Chief Inspector of Fruit, be asked to visit the district, and Mr. Wright and the Hon. Secretary are to meet him and place the matter before him.

OFFICERS.—Messrs. J. Pelling and A. L. Morphett were elected Chairman and Hon. Secretary respectively.

Inkerman, January 8.

Present—Messrs. W. Board (chair), J. Lomman, C. E. Daniel, and W. A. Hewett (Hon. Sec.).

WATERING HORSES.—Members consider that the idea of watering horses three hours after feeding to be altogether impracticable. [And it would be intensely cruel in our climate.—GEN. SEC.] Horses on a farm will do best when allowed to drink whenever they desire to do so. Still, it would be very unwise to give water to a horse that has been driven rapidly, or just before it has to be driven.

FEEDING OATS.—Members are all agreed that crushed oats are most easily and perfectly digested by horses.

BRAN VERSUS OATS.—With chaffed wheaten hay it is best to mix bran; but with “cocky chaff” it is best to use crushed oats, though some members prefer to mix bran and pollard with it.

Brinkworth, January 31.

Present—Messrs. S. Aunger (chair), J. F. Everett, G. Freebairn, A. W. Morrison, G. Wooldridge, W. Wundke, R. Cooper, C. Ottens, H. J. Welke, J. Stott (Hon. Sec.), and two visitors.

WHEAT EXPERIMENTS.—Samples of wheat grown from Bureau seed were tabled for inspection. Mr. Ottens sowed about 3lbs. Ranjit on unmanured sandy clay soil, and reaped 72lbs. of grain, weighing 64½lbs. per bushel. The sample was clean and good. The plant stood out well and ripened early; sown on May 21 it was reaped on November 24. Members were well pleased

with this variety. Mr. Freebairn sowed 4lbs. of Majestic and reaped 123lbs. of grain, weighing 63lbs. per bushel; the sample was very "smutty." Mr. Morrison sowed 3½lbs. Marshall's Hybrid and harvested nearly 70lbs., averaging 63lbs. per bushel. These two wheats were somewhat pinched, but no more so than the seed received from the Bureau. Mr. Welke obtained 97lbs. of grain from 4lbs. of Silver King wheat; the grain weighed 65lbs. to the bushel, was a fine large berry, and very promising. Members considered that Ranjit and Silver King were very promising and likely to pay well in this district. It was decided that the growers hand over to the Branch one-fourth of the produce from the seeds received.

DRILLS AND FERTILISERS.—A long conversational discussion on this subject took place. Members were mostly in favor of drilling in seed and manure together as against drilling in the manure and broadcasting the seed, though some had had good results from the latter method on clean land. Members considered that the wheat plant started to grow quicker and keeps more even if the seed is drilled in with the manure.

RAINFALL.—Mr. Freebairn reported that the average annual rainfall recorded at Condowie during past ten years was 14.51.

EXHIBIT.—Mr. Everett tabled fine sample of tomatoes grown without irrigation.

Auburn, January 31.

Present—Messrs. G. R. Lambert (chair), W. F. Keynes, P. Cornwall, J. T. Kirkbright, J. Hean, E. M. Dudley, and Dr. Yeatman (Hon. Sec.).

STARLINGS.—Discussion on the damage done to vineyards and orchards by starlings and on the rapid increase of these birds in the district took place. It was resolved to ask the local council if they could offer a reward for the heads and eggs of the birds as was done for sparrows, and also to suggest that the District Councils Association be approached with a view to united action being taken in the matter.

CLOSING BRANCH.—Members discussed at some length the advisableness of closing the Branch as no new members came forward and the present members had not sufficient time to devote to writing original papers. It was decided to postpone discussion till next meeting.

REWARD FOR THE DISCOVERY OF PHOSPHATES.

Office of the Minister of Education and Agriculture,
Adelaide, January 20, 1900.

Rewards are hereby offered for the discovery and working within the colony of a deposit or deposits of marketable mineral manure, as under:—

1. £500 if found on Crown lands; £250 if found on freehold lands.
2. If found on Crown lands, the discoverer will be entitled to a lease of the land upon which the discovery is made, in terms of Part VI. of the Crown Lands Act of 1888, providing for a lease of 640 acres for twenty-one years.
3. The above rewards will be payable to the discoverer at the Treasury, Adelaide, on the certificate of the Professor of Agriculture that the following conditions have been complied with:—
 1. That the deposit is easily accessible, and within a reasonable distance of a railway or seaport, and not within twenty-five miles of any discovery on account of which any bonus has been paid.

2. That the deposit is sufficiently abundant, and is available at a price which will allow of it being remuneratively used for agricultural purposes.
3. That the product is of a good marketable quality, averaging not less than 40 per cent. of phosphate of lime, provided, however, should a phosphate of a lower average composition be discovered, the Professor of Agriculture may recommend that a portion of the reward be granted.
4. The terms of payment will be $\frac{1}{5}$ (one-fifth) on the production of the first 200 tons; the remaining $\frac{4}{5}$ (four-fifths) to be paid, $\frac{1}{5}$ (one-fifth) on production of each additional 200 tons.

Applications, addressed to the Minister of Agriculture, Adelaide, will be received up to and including the 31st day of December, 1902.

E. L. BATCHELOR, Minister of Agriculture.



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and found Employment by Government Departments and Private Employers from November 30, 1900, to January 30, 1901.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youth laborers	200	293	561
Carpenters and adzers	14	7	1
Bricklayers, masons, and plasterers	2	3	6
Boilermakers, blacksmiths, and strikers	3	5	3
Riveters, iron and brass moulders	4	2	2
Fitters and turners	4	4	6
Enginedrivers, stokers	4	2	2
Rivet boys	5	—	2
Apprentices	21	5	2
Cleaners and glut cleaners	17	27	9
Carriage-washers and junior porters	85	24	14
Farm hands and gardeners	3	—	5
Wattle-strippers	—	—	5
Married couple	—	—	1
Painters and improvers	4	—	3
Baker, cook, and sculleryman	2	2	3
Sailmakers	2	—	3
Messenger	—	—	1
Compositors	3	—	8
Electrical engineer, civil engineer	3	—	—
Electroplater, galvanizer	2	—	—
Printer and bookbinder	2	—	—
Master mariner	2	—	—
Patternmaker	1	1	—
Diamond-driller	1	—	—
Plumber's assistant	2	—	—
Tuckpointer	1	—	—
Totals	387	375	635

January 30, 1901.

A. RICHARDSON, Bureau Clerk.

General View of the English Factories Acts.

CONTRIBUTED BY INSPECTOR BANNIGAN.

(Continued from page 504.)

CERTIFICATES OF FITNESS FOR EMPLOYMENT.

In a factory it is necessary to obtain from the certifying surgeon for every child or young person under 16 employed there a certificate of fitness for employment in that factory. The occupier is allowed seven work days in which to obtain the certificate, or, if the certifying surgeon resides more than three miles from the factory, thirteen work days.

This obligation to obtain certificates of fitness does not exist in the case of workshops, but the Secretary of State has power to extend it to workshops.

The occupier of a workshop may, if he thinks fit, as a precautionary measure obtain from the certifying surgeon certificates of fitness for children and young persons under 16 employed in his workshop.

In the case of any particular child or young person under 16 employed in either a factory or a workshop who appears to the inspector to be incapacitated for ordinary daily work by disease or bodily infirmity, the inspector may serve notice on the occupier of the factory or workshop, requiring him to discontinue the employment of the child or young person from the period named therein, not being less than one day nor more than seven days from the service of the notice. After the expiration of that time the occupier may not employ the child or young person until he has obtained from the certifying surgeon a fresh certificate that the child or young person is not incapacitated for work.

The certificate of fitness must deal with two points—the age of the child or young person, and the absence of incapacity, on the ground of disease or bodily infirmity, for daily work during the time allowed by law. The age of the child must be proved to the certifying surgeon either by production of a certificate of birth or by other satisfactory evidence. A certificate of birth may be obtained for 6d. It consists either of a certified copy of the entry in the register of births, or of a certificate from the school authority based on the returns made to them by the Registrar of Births and Deaths. If the age of the child or young person is proved to the certifying surgeon by evidence other than a certificate of birth, and the inspector has cause to believe that the real age is less than appears in the certificate of fitness, the inspector may annul the certificate of fitness.

In order to certify that a child or young person is not incapacitated from daily work, the certifying surgeon must first make a personal examination of the child or young person. The examination must be held and the certificate signed at the factory or workshop, unless either the number of children and young persons employed at the factory or workshop is less than five, or there is some other reason allowed in writing by the inspector.

The certificate may be made to apply to all or any of the factories or workshops in the occupation of the same occupier, and in the district of the same certifying surgeon. A certificate of fitness for employment in a tenement factory is valid for similar employment in any part of the same tenement factory.

If the certifying surgeon refuses to grant a certificate of fitness, he must (if required) give the reasons for his refusal in writing.

When a child reaches the age of 14, and thereby becomes a young person, a fresh certificate must be obtained of his fitness for employment under the new conditions.

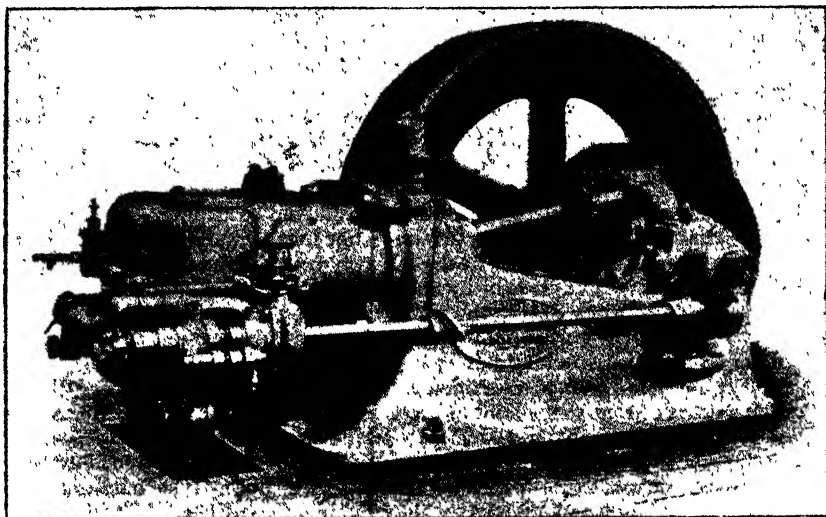
The certificate of fitness must (when required) be produced to the inspector by the occupier.

Safeguarding the Crank of Gas Engine.

The accompanying illustration will afford a very good idea of the manner in which cranks of engines and other similar mechanisms should be guarded to avoid accident through contact with the moving parts.

The danger from engine cranks is chiefly to be apprehended from want of caution on the part of the attendant when oiling or trying the bearings while the machinery is in motion. Thus it may happen that an attendant standing in a safe position to test one side of the bearing may inadvertently extend his arm diagonally over the crank to test the other side and be struck by the revolving crank.

To minimise the danger a steel hood encloses the crank in such a way as to render it comparatively safe, while the moving parts are in no way hidden from view or rendered more difficult to get at.



The inspectors of factories are now giving directions for safeguarding engine cranks and other machinery in all factories, and where the parts are obviously dangerous the above pattern of crank-guard has been adopted as the most suitable for all purposes.

WOMAN'S WORK.—In the justly indignant agitation against the “sweating” evil which took place last year a very strong plea was made for domestic service as being a more wholesome and useful sphere for girls than the enervating influence of factories and workshops. That there are scores of comfortable homes to be had almost for the asking by girls qualified, and those willing to qualify, in the department of household tendance the cases cited by many in positions to conscientiously judge amply testify; and it is indeed a pity, which amounts almost to a reproach, that such should be the case when we consider the large number of hard-worked factory girls and home workers who eke out a meagre existence on the starvation rates of pay which at present rule in the various classes of woman's labor. A factor which has a great bearing on the girl's choice in the matter rests with the fact that free evenings, a half-holiday per week, and a clear Sunday are privileges which only the factory hands can command, and they are privileges, too, which cannot be lightly overlooked. The social life of this sunny land of ours being largely, and of necessity, “out of doors,” so to speak, not to mention the ever-growing feeling for independence characteristic of our nation, tends to enhance the value of such opportunities for recreation. Be the hours ever so long and the work ever so hard, the factory girl knows that a period of rest and freedom, short though it may be, awaits her, and those who have observed her indulging in her hard-earned pleasure know well that she has developed also the faculty of enjoying them to the fullest extent. The clinging to employments which allow such privileges is quite in accordance with human nature; but, like everything else, it is paid for with a price.

Journal of Agriculture

AND

Industry.

No. 8. REGISTERED AS]

MARCH, 1901.

[A NEWSPAPER. VOL. IV.

NOTES AND COMMENTS.

The summer has been more changeable and cooler than usual, but it has also been dryer, and the water trouble in many districts has reached an acute stage. During the past month there have been splendid rains, 4in. and over in some parts, throughout a very considerable area of our pastoral country which has suffered so severely from drought. These rains have also extended into the adjoining States, and though it is too early yet to say to what extent the drought has broken up, there appears every reason to hope that the area benefited by these rains is very large. In the hills near Adelaide and in the South-East bush fires have been very prevalent, and serious losses have occurred. In the Mount Pleasant district in particular the fires have simply been disastrous to a considerable number of stockowners.

The *Register* estimate of the late harvest gives a total production of 13,200,000bush. from 1,600,000 acres reaped, or an average of 8bush. 15lbs. per acre on the *area reaped*. They estimate the total area sown as a little over 2,000,000 acres, a large area of which was cut for hay, or failed owing to the drought on the "fringe country." After deducting local requirements for food and seed, the amount of new wheat available for export is put down at 265,170 tons, which, added to the balance of about 50,000 tons carried forward from the previous year, gives 315,000 tons as available for shippers at the new year. The value of the new wheat available for export is, at market rates, about £1,300,000. Last harvest is the most satisfactory since 1893, and but for the unseasonably hot weather in October would have been the best for many years.

Mr. A. N. Pearson, the Victorian Agricultural Chemist, says—"The extent to which the soil moisture may be conserved by sufficient stirring of the surface soil has not yet been fully recognised in the dry districts. The difference of evaporation from a soil with the surface stirred and from one not stirred may, in a hot summer, be equivalent to 1in. or more rain a month. By putting the disc harrow over the stubble immediately after harvest, and harrowing the young growing crop once or twice, even an old paddock not fallowed may retain sufficient moisture to insure a substantial crop." The experience of most South Australian farmers is that early fallowing, so as to allow the winter rains to penetrate, and well working the fallows, is worth several inches of rain to the next crop.

A considerable number of our farmers who are unable to purchase a seed and fertiliser drill, or who find the practice of drilling in the seed and manure together requires a greater strength of horses and men than is available during seedtime, have adopted the practice of putting the manure into the ground while it is dry and easily worked, and broadcasting the seed later on. This practice has given very satisfactory results, and as it enables a farmer putting a fair area under crop to wait until the ground is in a fit condition for seeding, and at the same time facilitating seeding operations, it is worthy of careful tests by those who have not yet tried it. Of course only clean fallow land should be sown in this way. In this connection the paper read by Mr. R. Marshall, late of Home Farm, Templers, at our recent Congress, on the "Preparation of the Soil for Seeding" is worthy of study. The paper will be found in the October issue of the *Journal of Agriculture*.

The enormous yields of milk from certain breeds of cows in the show yards are often quoted, but usually nothing is said as to the quantity and quality of the food consumed. A dairy cow is practically a machine for converting the food she consumes into milk. The *American Agriculturist* states that the Holstein cow, Rosa Bonheur 5th, which held the world's record, having produced 106·75lbs. of milk in one day and 726·25lbs. in a week, ate daily 114lbs. silage, 12lbs. cornmeal, 9lbs. oatmeal, 3lbs. bran, 9lbs. oilmeal, and 27lbs. of roots. This is rather a startling ration, and is worthy of study on the part of our dairymen who, on the strength of show and test records, may be inclined to try the Holstein cattle on our poorer pastures. It is not always the cow that gives the most milk that is most profitable, but rather the one that produces a pound of butter on the least food.

The New South Wales Dairy Expert has reported to his Minister that he has succeeded in isolating the micro-organism which causes "fishiness" in butter. If this proves to be correct it will be good news to Australian dairymen, as once the source of the trouble is known the search for a cure or for preventive action is much simplified. No doubt many who know of the careful search that has been carried out for many years in all parts of the world for the germ of "fishy" butter without success will suspend judgment on Mr. O'Callaghan's report pending confirmatory evidence of the correctness of the same.

The Orient liner *Ormuz*, which sailed on February 21, took the first consignment of apples for London for the 1901 season. She shipped 13,340 cases at Hobart, 2,227 cases at Melbourne, and 1,802 cases at Adelaide. The apple season throughout the colonies promises to be good. It is estimated that Hobart shipments will amount to 230,000 cases, as against 170,000 cases last year. Melbourne and Adelaide shipments will also show a large increase; and considerable doubts were felt as to getting necessary space in the steamers for all the fruit available. This has, however, been arranged, and sixteen steamers in all will call at Hobart. Could the expenses of shipping be appreciably reduced, there is no doubt London would take all the apples we could produce and sell at a reasonable price, as, owing to our position, Australia practically has sole command of the market for several months.

The absolute necessity for taking every possible precaution against the introduction of new pests affecting cultivated crops is emphasised by some remarks recently made by Mr. Alex. Crow, the Californian horticultural quarantine officer. Amongst the instances of damage resulting from the introduction of insects mentioned by him, the following are typical:—A large orchard in North Carolina, of 60,000 bearing trees, was so seriously affected by an imported scale insect that the trees have all been cut down and burned. Another orchard of 20,000 trees in Maryland was completely destroyed by the same insect within two or three years. A small white scale, *Diaspis amygdali*, is characterised as worse than the San Jose scale. In an orchard in Georgia, containing 25,000 trees, 10,000 were reduced to such a condition by this insect that they were dug up and burnt. In Mexico the orange maggot reduces these fruits to a disgusting mass of pulp. In Japan and Hawaii they have a maggot that destroys about 75 per cent. of the fruits of melons, cucumbers, and squashes.

In Victoria and Tasmania considerable inquiry and experimental work has been carried on with a view to finding a satisfactory remedy for apple scab, or black spot as it is called in Victoria. Frequent references have been made by the horticultural papers to the losses resulting from the absence of such remedy. To South Australian growers this has been a matter for considerable surprise, as, over nine years ago, experiments carried out by several growers in the Angaston district, under the auspices of the Bureau, proved early spring applications of Bordeaux mixture to be a most effective remedy for the disease, and from that time the practice of spraying the trees has become general, though a good many orchardists allow press of other work to push this important work aside, and, in most cases, regret their neglect when we have a damp spring. We have scarcely a single orchardist who has used Bordeaux mixture properly who has any doubts as to its efficacy in preventing both apple and apricot scab. Possibly the climatic conditions have something to do with the failures in the other colonies. In Victoria a Mr. Grant claims to have discovered a remedy much more efficacious than Bordeaux mixture, and at the same time much cheaper. This is now being inquired into by the Department of Agriculture of Victoria. In connection with this matter Professor D. McAlpine states that much of the ineffectiveness of Bordeaux mixture is due to its being washed off by the rain, and says that the addition of acetic acid, which can be produced by the orchardist from the windfall and culled apples, is very much more effective than treacle or sugar in causing the spray to adhere to the trees.

The famous Luther Burbank states in recent American issues that his "Plum-cots," produced by crossing of apricots and plums, are the latest wonder in the fruit line. The fruit has the form of the apricot and the same general outside appearance, but is more highly colored than either apricots or plums. The rich flavor of the fruit is said to be a revelation of new fruit possibilities. Mr. Burbank also reports favorably on the improvement he has effected in his seedless plums and prunes. Australasian horticulturists will doubtless watch with interest the advent of these latest creations in the fruit line, and should the expectations raised by the statements as to their merits be fulfilled, they will soon become popular in this part of the world.

A New Zealand paper states that autumn grown potatoes of medium size, which are the best for seed, only throw single eyes and generally this is a strong one. The five or six tubers produced in such cases are usually of good marketable size, even under unfavorable conditions, whereas if there are three or four stems with six tubers to each, the crop, though slightly heavier, would be inferior for market purposes.

At the Uraidla Show the regulations for preventing the spread of the codlin moth were severely criticised, and a prominent legislator characterised the decision arrived at by the Select Committee of the House of Assembly (of which Committee he was a leading member) after careful inquiry last year as "foolish." The usual statements that the caterpillar made no difference to the fruit, as the burrowed portion could be readily removed, and that South Australia was the only place in the world where so much notice was taken of the pest received prominence, notwithstanding that ample proof has on more than one occasion been given that the latter statement is incorrect. As to the fruit not being really damaged by the caterpillars, most consumers, who are surely interested in this matter, will doubtless differ from the growers who make this assertion. Growers who desire to keep this pest from spreading further should carefully watch any agitation for the repeal of the regulations.

There are two points in connection with the demand of a few growers for the repeal of the codlin moth regulations that are worthy of serious attention. One is that if infested fruit is allowed to be sold in Adelaide there will be no chance of exporting apples and pears to Broken Hill and other parts of the adjoining States. At present both New South Wales and Victoria require that all fruit for those States must be accompanied by an official certificate that they are free from codlin moth, scab, scales, and other pests. With the unrestricted sale of infested fruit it would be absolutely impossible for the inspectors to issue such certificates. The second point is that with the repeal of the regulations every orchard in the colony will within a very short time be infested. Only recently one of the inspectors found a carrier taking drayloads of empty cases, which had contained infested fruit, into an important district where, up to the present, the efforts to keep the pest from spreading have been attended by gratifying results. These cases were being unloaded at different gardens along the carrier's route, and many of them were infested with caterpillars, as many as six being found by the inspector in a single case. This alone is sufficient to spread the insect over a large area of country. The question for consideration is in a nutshell—Is our apple-growing industry worth protecting?

Mr. U. P. Hedrick, of the Utah Agricultural Experiment Station, reports an instance that has come under his notice of the codlin moth being kept in check by the digger wasp (*Ammophila prunosa*). Two small areas in the orchard were found to be occupied by the wasps, thirty-nine burrows being found in a space 18 in. square. The wasps were attacking both the cabbage worm and the codlin moth caterpillar, and the owner of the orchard stated that he never had to spray his trees, yet the fruit was remarkably free of caterpillars. This is the more remarkable as the orchards in the region are badly infested. On some of the burrows of the wasp being examined, from one to three caterpillars were found.

A Californian horticulturist who has been feeding the small undersized prunes to his horses says:—"I think I have given the prune a fair trial for this purpose during a period of three years, and can confidently state that I have found it equal, pound for pound, to barley as a food." South Australia has an immense crop of plums this year, and large quantities have been sold in the market at 1s. per case of 56lbs. to 60lbs. Would it not be worth while for some of our orchardists trying their value as food for pigs, horses, &c. The drying is a very simple and inexpensive process. The cured product should be worth, for this purpose, more than the price obtained. It is not, of course, suggested that the bulk of the crop should be utilised; but if some portion were, the price for the balance might improve.

In California the fumigation of fruit trees is undertaken by some of the county boards of horticulture. During 1900 the Los Angeles board had nearly 1,500,000 trees treated, being more than double last year's number. Nearly 1,000 tents were in operation, and for the coming season at least 1,500 will be used. Many growers are so satisfied with the results that they are purchasing fumigating outfits. The cost of fumigating has averaged about 40 cents. (say 1s. 8d.) per tree; but the grower is more than repaid for this outlay, which is less than the cost of spraying the trees affected by scales.

In the *Journal* of the Department of Agriculture for Western Australia for January, 1901, there appears a statement by Mr. J. Cramer to the following effect:—"He next visited South Australia, and was surprised to find they were much behind this colony in their fruit-growing." This will, indeed, be news to South Australians. We wonder what parts of our fruit-growing districts Mr. Cramer visited that should have led him to this conclusion. The strangest part of all is that, notwithstanding the fact that we are "much behind" the Western State in our fruit-growing, we should be able to send so many thousands of cases of fruit there, besides exporting very largely to Broken Hill and elsewhere. In the same issue of the *Journal* as the above appears the prices ruling in Western Australia for certain fruits for week ending January 10. Peaches, apricots, apples, plums, and pears in each case rule from twice to three times the prices ruling in South Australia. Perhaps, however, Mr. Cramer meant that our prices were much below those of his State. The same gentleman also compares Victorian horticulture very unfavorably with that of Western Australia. Does he wear rose-colored spectacles when viewing the orchards of his own country, and blue goggles when going abroad?

The system of preserving eggs by means of cold storage has developed to an enormous extent in America. In Chicago four very large cold storage houses lay themselves out for this trade, and during September of last year 600,000 cases, each containing 30 doz eggs, were taken into cold storage at the Chicago Stockyards. Two of the largest packing houses have between them 216,000,000 of eggs in cold storage. The eggs are kept for six to eight months, and even longer. Eggs are also kept in bulk, the white and yolk being preserved separately in air-tight tins.

"JOURNAL OF AGRICULTURE" OF SOUTH AUSTRALIA.

AGRICULTURAL ADVERTISEMENTS.

In response to several requests, the Hon. Minister of Agriculture has decided that advertisements of approved character may be accepted for the above *Journal*.

The circulation of the *Journal* is about 2,100 monthly, of which over 1,400 go to the members of the Agricultural Bureau throughout the colony, a great majority of whom are actively engaged in agricultural pursuits. The *Journal*, therefore, offers a splendid opportunity to advertisers to bring their goods, &c., under the notice of cultivators of the soil.

Only advertisements dealing with distinctly agronomical items, such as seeds, manures, implements, wool, wheat, farm supplies, &c., will be accepted. No advertisement for a less term than three months will be received. Alterations to advertisements must reach the Editor not later than the 25th day of any month.

The charges for advertisements will be—

Half page—For three insertions, £3 10s.; six insertions, £6 10s.; twelve insertions, £12.

Full page—For three insertions, £5 10s.; six insertions, £10 10s.; twelve insertions, £20.

All communications to be addressed to—

"The Editor, *Journal of Agriculture*,
Agricultural Bureau Office, Adelaide."

THE COORONG SAND HUMMOCKS.

Report by the Editor to the Hon. the Minister of Agriculture and Education

I have the honor to report that, in accordance with your instructions, I examined the country adjacent to the coast from Goolwa beach to the "Needles," on the Coorong Lake, a distance of about fifty miles, with an average estimated width of nearly two miles. I started from Adelaide on February 1 and returned on February 13.

On arrival at Goolwa I was first met by Messrs. G. and William Gardner and Alderman Charles Tucker, M.P., who occupy miscellaneous leases of sand hummocks between Goolwa beach and the Murray mouth. This locality some time since consisted of a considerable area of very fertile land, covered with sheoak trees and shrubs of many varieties, and was heavily mantled with native clovers, grasses, and other valuable fodder, and capable, under suitable cultivation, of yielding highly profitable crops of roots, tubers, and oats and barley.

Owing to the injudicious destruction of the indigenous vegetation on the sand dunes next adjacent to the seacoast, and more especially to the introduction of sheep (particularly of Merino sheep, which are more gregarious than other varieties), the sand dunes became exposed to strong prevailing

winds and were dispersed landwards, covering up the whole of the valuable richly-grassed flats, and converting a pastoralist's paradise into a desolate wilderness of shifting sand.

In some places the whole of the sand hummocks—say half a mile wide and 30ft. high—have been levelled by the prevailing winds, and in one place near the present mouth a length of nearly a mile has been brought down almost to level of high-water mark, and during high tides and strong south-westerly gales the sea makes a clean breach across to the Goolwa channel. The sand has not only covered the once fertile flats, but has filled the channel for a distance of about 400yds. in some places, so that where craft of considerable tonnage could once sail there is nothing but loose dry sand.

What will be the result of this drifting in the near future is a matter for most serious consideration. The present channel through the Murray mouth is, perhaps, 400yds. wide, and is very shallow comparatively, with constantly shifting sand spits, which are extremely dangerous to navigation during stormy weather. When the outlet for the flow of the Murray and lakes water is extended to a mile or two miles (as it will probably soon be unless action is soon taken to prevent this disaster), the Murray mouth will become absolutely closed to all possibility of navigation, and the Goolwa channel will be filled up till nothing remains but a wide shallow swamp or shoal.

This disaster *can* be prevented at a very moderate cost in comparison with the enormous damage that must result in the near future from the obliteration of the present channels through the Murray Mouth and the Goolwa waterway, and should also quickly be recouped in the value of the land that can be rescued and reclaimed by the re-establishment of the Hummocks, and of the indigenous vegetation supplemented with cultivated exotic plants.

I do not intend to imply that the cost of this reclamation will be insignificant—quite the contrary, it must necessarily be considerable; but, I repeat, that the damage resulting from the filling up of the Goolwa channel and the navigable water of the Coorong and Lakes Alexandrina and Albert will be enormous. Neither will the damage cease when this destruction is completed, for every tide and every storm will pile fresh sand on the beach, which, upon being dried by the sun and wind, will be carried inland till all the arable and pastoral land becomes a sandy waste, with never a plant of any kind upon it. Supposing, then, that these disasters can be prevented—and I propose to attempt later on to show how this can be done—the security to the navigability of the Goolwa channel, the Murray Mouth, and the lakes, added to the value of the land that can be reclaimed—even re-formed and converted into pasturage and in part to cultivable land—will justify me in the assertion that the cost of the work will be moderately small in comparison with the enormous gains that will accrue from carrying it out.

From the mouth to the Needles—a bar of rocky islets right across the Coorong channel, about forty miles from the mouth—the sand hummocks are of considerable height, in places probably 200ft. This land, I suppose about 100 square miles, I was recently informed, has carried as many as 4,000 sheep and 175 head of large stock for seven or eight months, in addition to small herds of store cattle for fattening. This was several years ago, when extensive flats existed, upon which native clovers, grasses, and edible shrubs were most abundant. The protecting plants on the sand hummocks were destroyed, at first by the sheep, and later on the destruction was completed by the rabbits, and now the whole area would probably not support fifty head of great cattle. Mountains of sand are rolling in from seaward, filling up the valleys and flats, till 100ft. to 150ft. of loose drift covers the trees, shrubs, and grass that once prevailed. Skeletons of the aborigines that were buried ages ago are uncovered on many a hill, and thousands of their ancient cockle bakes

are to be seen in every direction. Cliffs of drifting sand from half a mile to nearly a mile long may be seen in places, slowly but surely marching over the face of the country, filling up those fertile flats and valleys, and threatening, in a very short time, relatively, to fill the Coorong and flow still onward to the northward over the richly-grassed and thickly-wooded sheoak hills on the northern side of that channel. Needless to say, those sand cliffs cannot be climbed by any living animal; but there are long steep ascents that can be negotiated with much labor and no satisfaction, because, when the top is at last reached, the outlook is most distressing—sand, shifting sand, everywhere, rolling always forward, and slowly but surely covering up the last remaining vestiges of the once all-present luxuriant vegetation. All along the Coorong the sand has been encroaching, in places hundreds of yards, and in all parts the depth of water has been more or less decreased through the drifting sand. Of course, this is most noticeable on the side nearest to the hummocks.

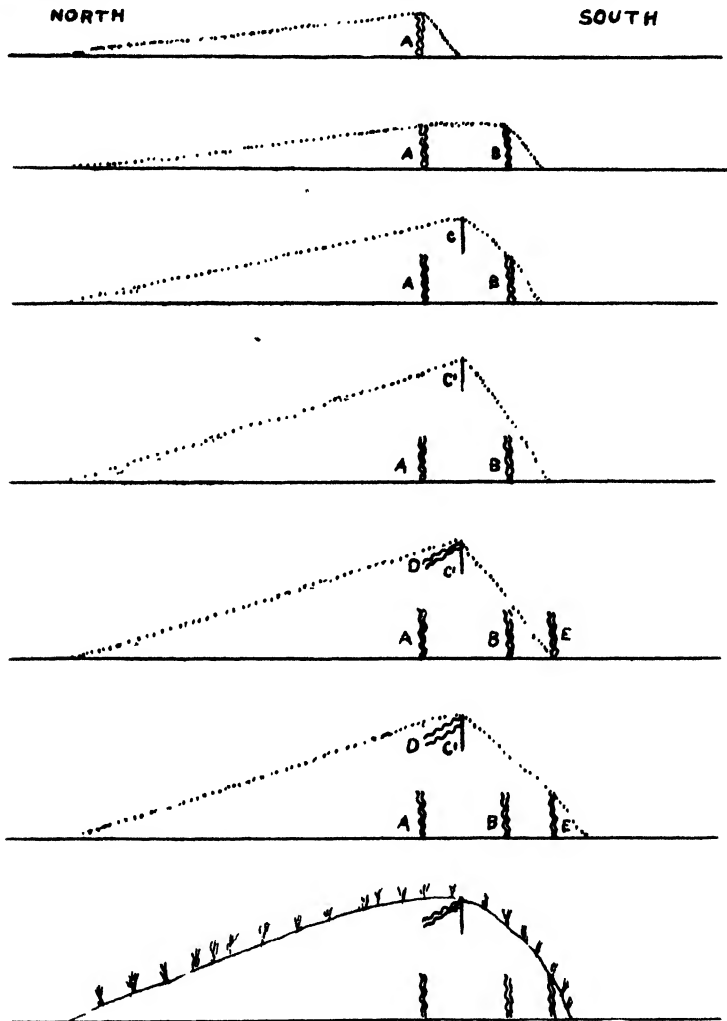
I am sure that some people will say that the blame of all this devastation cannot be charged to the pasturing of sheep. Some will blame the climate, which they aver has changed, causing drought and death of all the shrubs and other plants; and many others will say the rabbits are the sole cause of the trouble. But those who know what havoc can be effected by sheep, even upon macadamised roads, by breaking up the surface, or upon hard ground in the vicinity of watering troughs, or the lighthouse-keepers at Cape Willoughby or Corney Point can bear witness that sheep—especially Merino sheep—will, in a short time, ruin a sandy country through their gregarious habits, to say nothing about their close cropping of the herbage, upon which they may be crowded in too great a number.

However, whatever the cause, the fact remains that the sand hummocks for sixty miles or more along the Coorong and Goolwa channel are rapidly shifting northward, and it has become a matter of national importance that the State should endeavor to stop the evil, and, if possible, reinstate the grasses and shrubs that once covered the whole area.

Such work has been undertaken on a small scale in various parts of this colony with success. Several years ago I learned that the lighthouse-keepers at Corney Point were in trouble through drifting sands, and I procured some Marram grass and creeping spinifex from Mr. Turner of the New South Wales Department of Agriculture, and sent it to Corney Point through the agency of the Engineer-in-Chief, who forwarded it through the Marine Board, and now I understand the drift at Corney Point has been quite prevented. By my advice to the Superintendent of Southern Railway lines, lupins and Marram grass were employed at East Wellington and on the Port Victor line with excellent results in stopping shift sands. The remarkable success attained with Marram grass at Port Fairy, in Victoria, has led several people in our own State, as well as those in the Eastern States, to adopt Marram grass, with equal success, for preventing drift sand. Very many instances are recorded of successful efforts to arrest drifting sands in the United States, but perhaps the most notable and encouraging example exists in Gascony, on the western coast of France, where a large area, known as the Landes, comprising over 300 square miles, has been converted from a rolling waste of drifting sand, quite destitute of any sign of vegetation, into a comparatively fertile country, covered with pine trees, and supporting quite a large and prosperous population upon the numerous cultural and other industries that have since been introduced.

As before stated, every tide and every storm throws up great quantities of sand upon the beach, and directly this gets dry it drives before the wind. But sand will not drift above a certain height or against certain high angles. Taking advantage of this fact, it has been usual to erect a kind of light brush

SKETCHES SHOWING METHOD OF ESTABLISHING A SAND CLIFF.



The first sketch at top shows brush fence (A), 40in. high, against and behind which the sand has collected. Second sketch shows two brush fences (A and B), also covered with sand. Third sketch shows palings or picket fence, standing 5ft. high, on top of sandhill previously formed, and also covered with sand. Fourth sketch shows fence lifted, re-erected, and covered with sand. Fifth sketch shows bundles of faggots (D), made of brush, laid on sand behind top of fence (which fence can now be removed), and a third brush fence (E), erected 6ft. in front of others at sea level. Sixth sketch shows third brush fence, covered with sand. Seventh sketch shows the cliff or hill complete, and permanently grassed. The palings or pickets should have been removed when the faggots were laid down.

fence, about 40in. high, at a point, say, 50yds. from high-water mark, across the line of prevailing winds. Very soon the drift sand banks up against this barrier and covers it, forming also a long tail at the back or leeward side. At

once another barrier is built to seaward, 40in. high, and at a distance of 8ft. or 10ft. The space between the two barriers is soon filled, and a bank formed in front of the windward barrier. Then a broad paling or board fence 5ft. high is erected on top of the hillock between the two barriers. This also gets covered in a short time, and a longer and steeper bank is formed to windward. The palings are closed to within a $\frac{1}{2}$ in., allowing a little sand to drift through, thus ensuring a compact bank to windward of the fence, otherwise there would be a kind of gully in front. Next the fence is pulled up and re-erected in the same place only higher. When this has again been topped by the sand a quantity of brush is laid on the sand at the back of the covered up palings, and another brush fence 40in. high is put up 6ft. in front of the bottom fence, near high-water line. The sand covers that also, and tends to complete the embankment. In the meantime the "tail" sands behind the fences have ceased to travel to any extent and are planted with grasses and other plants. This method is shown in sketch.

But since the recognition of Marram and other sand-binders, some considerable portion of the labor above indicated may be avoided, except, perhaps, in the case where there is absolutely no hummock or barrier upon which plants can be grown—such, for instance, as those places near the Murray mouth, where the sea makes a clean breach across to the Goolwa channel during storms. Here the barriers *must* first be erected, in order to form a sandbank, perhaps 10ft. high; and then most probably the native Hairy Spinifex (*Spinifex hirsutus*), Marram grass, &c., would do the rest of the work in stopping the drift.

There is urgent necessity that this work be taken in hand at once, especially that portion westward of the present Murray mouth. At least five miles in length west to east between the sea and the lake or channel should be planted each year until the whole is reclaimed; and strict regulations should be enforced with regard to the varieties and number of stock that may be put upon the land.

The integrity of the reclaimed land should be rigorously insisted upon, since most disastrous results would again follow overstocking with cattle and horses, or from the depasturing of sheep or goats upon the sandhills. It has been estimated that one head of large cattle could be maintained upon two acres of Marram grass; and some have gone so far as to assert that each acre would support a bullock. Such heavy stocking, I think, would be injudicious. It must not be forgotten, however, that there are quite a number of grasses and shrubs of far higher nutritive value than Marram that either grow naturally or can be cultivated on this country. Later on I will give a list of some of each class.

In planting the sand-binding grasses it is important to avoid placing them in lines following the course of the prevailing winds, because the winds will cut channels between the rows. The proper way is to plant across the course of the wind and on the septuple principle. Then the sand will be stopped by the plants, and will form a bank through which the grass will continually break, even though the sand should bank up 100ft. high. It is a peculiarity of Marram grass that it grows far more quickly through drifting sands than elsewhere. Again, when cut, or fed down, or when portions of large plants are removed for planting elsewhere, the old bunches make vigorous growth. It is usual to plant at 30in. apart each way. One man opens the sand by sticking in a spade and pushing it over, whilst another puts a rooted bunch into the opening. The spade is then withdrawn and the sand is trampled back against the grass. Possibly the planting could be done more quickly by aid of a double-breasted plough, but all these items are matters of detail that could be better decided by practical tests. The Marram grass and Sea Lyne grass spread by stolons running under ground. The Hairy Spinifex grows

very rapidly, in a similar manner to Buffalo grass, putting forth roots at every joint. The plants of this are male and female, and both grow best within range of the spray of the sea. All kinds of stock thrive upon this plant when they become accustomed to it. One of the saltbushes (*Chenopodium nitrariaceum*) grows very luxuriantly upon the almost pure white sand of the coast, is a splendid sand-binder, and is much relished by stock. The following is a list of plants that will be found of value in the work of arresting and reclaiming the drifting sand hummocks near the seacoast:—

A FEW OF THE BEST PLANTS NATURALLY GROWING ON SEACOAST SAND HUMMOCKS.

- Clematis microphylla*—A climber, called "Old Man's Beard," &c.
Bursaria spinosa (native box, good for sheep)—Sometimes with stem 14 in. diameter.
Pelargonium australe—A small species of "geranium."
Dodonaea viscosa (eaten by stock)—"Native Hop" bush.
Ptilotus crubescens—An insignificant annual called "Pussycats."
Kunzea pomiferum (native apple, fodder)—An excellent sand-binder.
Acacia longifolia (native apple, fodder)—An excellent sand-binder.
Acacia pycnantha, &c., &c. (Golden wattle, fodder)—Grow only on the settled sands.
Myoporum insulare ("Myrtle," fodder)—"Blue currant," excellent on sand.
Chenopodium nitrariaceum (fodder)—One of the numerous "Saltbushes."
Atriplex pallidosum (fodder)—One of the numerous "Saltbushes."
Bassia dicantha—Has a small reddish fruit.
Salsola kali (good fodder)—"Buckbush," an excellent standby for summer.
Muehlenbeckia adpressa (creeper)—"Native sarsaparilla."
Mesembrianthemum australe (stock eat it)—"Pigfaces," "Native fig," a good sand-binder.
Mesembrianthemum crystallinum ("Iceplant")—A good sand-binder, annual.
Tetragonia implexicoma—Has silver-white leaves, looks like an *Atriplex*.
Acacia salicina (fodder)—"Broughton Willow?" fodder.
Kennedy prostrata—"Native tares," handsome flowers.
Melaleuca parviflora—A teatree.
Melaleuca pustulata—A teatree; the paper-bark teatree.
Leptosperma laevigatum—Bears "apple blossoms"; allied to teatrees.
Apium prostratum—"Wild parsley."
Santalum persicarium (fodder)—Native peach.
Hakea rugosa—Has very prickly leaves.
Banksia marginata—The very large-flowered dwarf "honeysuckle."
Aster axillaris—Stinkbush.
Aster glaucescens—Stinkbush.
Calocephalus Brownii—All blunt points, no leaves, greenish white.
Senecio lautus—One of the "groundsels."
Senecio cuninghamii—One of the "groundsels."
Wahlenbergia gracilis—Blue, flax-like flower and plant.
Scaevola microcarpa—Small bush.
Goodenia geniculata—Small bush.
Goodenia albiflora—Small bush.
Alyxia buxifolia—Bears scarlet berries, intensely bitter.
Lycium australe—Allied to the boxthorn, one of the Solanaceae.
Eremophila oppositifolia (fodder)—Handsome shrub.
Staphelia humifusa, "cranberry"—Prickly, prostrate plant.
Staphelia patula, "cranberry"—Very dense.
Staphelia australis—Tall, up to 7 ft., has smooth leaves.
Callitris verrucosa—Murray pine, also called *C. robusta* and *Frenela*.
Dianella revoluta.
Juncus maritimus—A rush.
Scirpus maritimus—A sedge.

GRASSES FOUND ON LOOSE SANDY SOILS

- Anthistiria ciliata* (fodder)—Kangaroo grass.
Bromus arenarius (fodder, excellent)—"Bromley grass" of S.E.
Distichlis maritima (fodder, excellent)—Like couch grass.
Stipas (fodder, excellent)—The "spear grasses."
Agrostis (fodder, excellent).
Danthonia (fodder, excellent).
Cynodon (fodder, excellent)—A "couch grass."

Poa (fodder, excellent).
 Festuca (fodder, excellent).
 Paspalum distichium (to be introduced, fodder)—Allied to *P. dilatatum*
 Panicum repens (to be introduced, fodder)—A millet grass.
 Spinifex hirsutus (indigenous)—Strong sand-binder.
 Zoysia pungens (prickly couch grass)—To be introduced.
 Imperatra arundinacea (indigenous).
 Cynodon dactylon (indigenous)—A couch grass.
 Sporobolus virginicus (indigenous).
 Distichlis maritima (indigenous).
 Schedonurus littoralis (indigenous).
 Lepturus incurvatus and cylindricus (indigenous).
 The following plants would probably be found valuable :—
 Sorghum halepense (Aleppo grass or Johnson grass).
 Psamma aronaria (Marram grass).
 Psamma littoralis—Said to be better, though also stated to be a synonym for Marram grass.
 Rye. Oat grasses. Barley grasses. Buckwheat.
 Tamarix gallica. Prickly pear. African boxthorn.
 Oenothera humilis, &c. (Evening primrose).
 Elymus arenarius (Sea Lyme grass)—Introduced at Robe.
 Pinus maritima—Maritime pine
 Pinus pinaster (for resin).
 Yellow lupin (best for fodder and green manure).
 Blue lupin (very successful at Wellington).
 Achillea millefolium—"Yarrow."

TESTING CHEDDAR CHEESE.

BY G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

To further illustrate the value of the acidity apparatus in the manufacture of cheese, arrangements were made some months ago with the manager of one of our factories to conduct a number of daily tests, and forward the results to the department along with a sample cheese from each day's manufacture. In all fourteen cheeses have been received, the ages of the samples varying from five to thirteen weeks.

For the benefit of cheesemakers I will append the complete acidity record, to be followed by the practical tests made of the individual cheeses.

Acidity Percentages.

Date of Manufacture.	Per Cent. of Acid at Renneting.	Per Cent. of Acid at Cutting.	Per Cent. of Acid at Whey Running	Per Cent. of Acid at Pressing.
October 30	0·21	0·13	0·17	0·83
November 1	0·21	0·15	0·19	0·75
November 3	0·20	0·14	0·18	0·78
November 6	0·23	0·16	0·20	0·69
November 7	0·21	0·14	0·19	0·72
November 8	0·22	0·16	0·20	0·72
November 10	0·21	0·14	0·20	0·84
November 13	0·23	0·16	0·19	0·78
November 14	0·25	—	0·20	0·75
November 15	0·18	0·13	0·19	0·78
November 17	0·19	—	0·18	0·74
November 20	0·18	—	0·18	0·80
November 21	0·20	0·14	0·19	0·70
November 22	0·23	—	0·21	0·84

Practical Examination.

For convenience, I have taken 50 points for maximum flavor and 25 for texture—total 75.

Date of Manufacture.	Points for Flavor.	Points for Texture.	Total Points.
October 30	40 (too sweet)	20 (holey)	60
November 1	39 (too sweet)	18 (crumbly)	57
November 3	38 (very sweet)	18 (dry)	56
November 6	48 (sharp and clean)	20 (holey)	68
November 7	40 (too sweet)	20 (dry)	60
November 8	46 (sharp and clean)	19 (dry)	65
November 10	38 (very sweet)	18 (very dry)	56
November 13	46 (sharp and clean)	20 (free)	64
November 14	30 (weak and sour)	16 (stringy)	46
November 15	44 (full)	20 (free)	64
November 17	40 (sweet and clean)	18 (crumbly)	58
November 20	45 (sweet and clean)	18 (crumbly)	63
November 22	43 (sweet and clean)	17 (crumbly)	60

In looking over the table of tests and grading awards, it will be observed that the cheesemaker has regulated the acidity in the vat, and in only three cases has the percentage exceeded 0.80. This careful manipulation has been attained notwithstanding the high and low readings in the milk preceding the addition of the rennet, and furnishes proof of the value of the hot-iron test combined with the burette. In glancing at the dates of manufacture, November 6, 8, 13, 14, and 22, the percentages of acid are high, and in each instance, excepting November 14, the quality of the cheeses was superior to the remaining number. November 14, with 0.25 per cent. acid in the milk, was productive of a weak and sour cheese; still, the acid, at pressing, did not exceed 0.75. Although these tests are not of sufficient guidance, other agencies having to be considered, still they show what has been repeatedly stated in the *Journal*—that it is necessary to have milk at the proper degree of ripeness before renneting, and when the cheesemaker is convinced of this, and can put the theory into practical effect, he has mastered a great difficulty.

Convincing evidence of the dangers accompanying unripened milk has been characteristically shown at every factory in the colony. In winter and in cool summer weather delay in the coagulation of the milk has attracted the attention of the factory manager, and this condition has been followed by a sluggish acid development and souring of the curd. Very often the cheesemaker finds himself plodding on at his vat and cooler when the usual time for pressing has arrived. Delay of this kind very often deals a death blow to the successful maturing of the manufactured article, and instead of the gradual ripening of the green curd to a good marketable product, when it is calculated to be eatable, or, in other words, "fully digested," the cheese is found to be sour and tough and unfit for the digestive juices of the consumer to play this important rôle in a satisfactory manner. It must be understood, however, that over-ripened milk will likewise produce cheese of an inferior quality, and usually accompanied with a taint. Still I affirm if the over-ripeness be natural or free from the presence of taint-causing organisms, the alert and skilled cheesemaker can check the acid and overcome it, and manufacture a good and marketable cheese.

In the dates of cheeses already quoted, excepting November 14, the best average was awarded for flavor. But we are quite aware that a satisfactory quality of cheese can be made from under-ripened milk, when the manufacturer alters his working to favor speedy acid development. The question is how

many can accurately ascertain the true condition of the milk without resorting to reliable tests. No cheesemaker can positively say, "I am assured that this vat has so-and-so acid in it and requires so-and-so treatment." Cheese-making is a most delicate business, which, unfortunately, is insufficiently realised. It necessitates skill in practice and scientific attention before success is attained. The day is gone when practice alone can place upon the market a product fulfilling the demands of a public taste, and capable of holding its own in the competitive world. Let the three secrets in the making of cheese be "when to add the rennet, when to run off the whey, and when to add the salt," and to ascertain these secrets do so by the application of the tests already advocated. Basing conclusions on the keenness of the senses of smell and feel by hand when milk is ready for renneting, and when curd should be removed to the cooler, is no longer recognised by authorities; and when cheesemakers realise that old prejudices should be left behind, and become firmly convinced that new and reliable methods must be adopted, the benefits will be of universal gain to both the public and the industry.

Holey and Gassy Curd.

The appearance of holey curds has come before my notice at a number of factories. In one case the pinholes were very numerous in the curd immediately before milling. Factories affected with this complaint would do well to examine individual supplies of milk, with a view to tracing the entry of the organism into the factory; but, before this is done, let every possible means be adopted to cleanse all utensils and cloths used in cheese-making, also to perfect the sanitary conditions inside of and surrounding the factory. When the manager is satisfied that the complaint is in the milk, the curd test should be applied, an explanation of which is given in the *Journal of Agriculture* for December, 1899. Cheesemakers might send me samples of affected curd, put into sterilised bottles, so that the organism may be isolated and cultivated.

GOVERNMENT BUTTER-TESTING.

By G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

The third butter test organised by the Government has been completed. The work on this occasion has not been so comprehensive as that accomplished in preceding years. Sufficient time could not be spared to enter into scientific research, which alone can lead to the discovery of taints peculiar to our produce.

At the conclusion of former tests a considerable amount of valuable information was obtained, and this year readers will find useful hints from the test now finished. Buttermakers would do well to refer to the *Journal of Agriculture* for January, 1900, and peruse the treatise elaborated in that number; also in other copies of the *Journal* the reader will find articles on butter-making that might be still further considered and put to more profitable account. Now that the winter is approaching, when work in the factory becomes less, there will be more time for study, and no reason for the *Journals of Agriculture* to remain on the office shelf unopened.

Test No. 1.

Unlike former years, only two factories supplied butter for testing purposes, one in the North and the other in the South-East. By selecting the North and South, for special reasons I was limited in the extent of my experiments and

in the width of comparison, which is so necessary in doing practical and scientific investigation. September opened the test with two boxes of butter from each factory. These, like the others to follow, were manufactured according to instructions given, and which were carried out very carefully by those to whom the work was entrusted.

The following were the instructions furnished in connection with Test 1 :—

1. The cream used must be from milk separated in the factory on Monday of the date fixed.
2. Ripen cream to a high degree of acidity.
3. Stir cream at intervals throughout ripening.
4. Churn at a temperature near as possible to 60° F.
5. Cream must be churned into grains.
6. Wash the butter-grains twice.
7. Carefully work the butter and dry salt at the rate of 3 per cent.
8. Work butter a second time and three hours after the first working.
9. Do not add a preservative.
10. Weigh boxes of butter.

MOUNT GAMBIER BUTTER.

On arrival of the boxes from Mount Gambier at the Government freezing chambers, on September 11, I made a practical test of the samples and awarded points as follow :—

	Flavor.	Texture.	Color.	Salting.	Packing.	Total.
Maximum	45	20	15	10	10	100
Awarded	42	19	15	10	10	96

Flavor.—There was a slight cowy taste, notwithstanding care in the selection of the milk, otherwise sweet. Texture.—Moist.

Immediately after the examination, one box of butter was placed in a cool chamber and kept at an average temperature of 28° F., while the other box was chilled at temperatures varying from 18° to 38° F.

At the expiry of forty-two days of refrigeration the butter was again tested.

Temperature Varying.

	Flavor.	Texture.	Color.	Salting.	Packing.	Total.
Maximum	45	20	15	10	10	100
Awarded	40	19	15	10	10	94

Flavor.—Sweet, but a little cowy.

Even Temperature.

	Flavor.	Texture.	Color.	Salting.	Packing.	Total.
Maximum	45	20	15	10	10	100
Awarded	40	19	15	10	10	94

Flavor.—Sweet.

No difference was observed in the quality of the butter after its exposure to steady and fluctuating temperatures, and it was quite evident, after the forty-two days' chilling, that the two boxes were unaffected in general characteristics, excepting the flavor was less distinct; but the cowiness was unchanged.

WILMINGTON BUTTER.

Tested September 4.

	Flavor.	Texture.	Color.	Salting.	Packing.	Total.
Maximum	45	20	15	10	10	100
Awarded	40	20	15	10	10	95

Flavor.—Faintly weedy.

After forty-nine days' chilling the second examination was made.

Temperature Varying.

	Flavor.	Texture.	Color.	Salting.	Packing.	Total.
Maximum	45	20	15	10	10	100
Awarded	37	20	15	10	10	92

Flavor.—Cheesy.

		<i>Temperature Even.</i>				
	Flavor.	Texture.	Color.	Salting.	Packing.	Total.
Maximum	45	20	15	10	10	100
Awarded	36	20	15	10	10	91
Flavor.—Cheesy.						

In flavor there is only one point of difference in favor of the even temperature.

We can account for this fair quality by the purity of the butter from milky brine and injurious organisms. In both cases plate cultures were made from the milk cream and butter, and although organisms foreign to good produce were found, still they were not observed in the butter cultures to an injurious extent. Had the butter, however, been milked, there is no doubt we would have had a lower quality in the flavor after refrigeration, and a more marked comparison at varied and even temperatures.

Test No. 2.

The butter for Test 2 was made from the cream of mixed milk separated in the factory, but no Monday's milk was used.

With detailed instructions of a similar kind to Test 1, it was recommended to brine one box of the butter in the churn, the remaining butter to be dry-salted on the worker, the other box to be salted in the usual manner at the rate of 2½ per cent.

The following test was made on October 9:—

MOUNT GAMBIER BUTTER.

Without Brine.

	Flavor.	Texture.	Color.	Salting.	Packing.	Total.
Maximum	45	20	15	10	10	100
Awarded	39	20	15	8	10	92
Flavor.—Weak Salting.—Milky brine.						

Flavor.—Weak Salting.—Milky brine.

With Brine.

	Flavor.	Texture.	Color.	Salting.	Packing.	Total.
Maximum	45	20	15	10	10	100
Awarded	39	20	15	10	10	94
Flavor.—Weak.						

Flavor.—Weak.

Second Examination, November 28.

Without Brine.

	Flavor.	Texture.	Color.	Salting.	Packing.	Total.
Maximum	45	20	15	10	10	100
Awarded	32	20	15	10	10	87

Flavor.—Very distinctly fishy

With Brine.

	Flavor.	Texture.	Color.	Salting.	Packing.	Total.
Maximum	45	20	15	10	10	100
Awarded	36	20	15	10	10	91

Flavor.—Faintly fishy.

WILMINGTON BUTTER.

Without Brine.

Tested October 9.

	Flavor.	Texture.	Color.	Salting.	Packing.	Total.
Maximum	45	20	15	10	10	100
Awarded	40	18	15	10	10	93

Flavor.—Sweet. **Texture.**—Streaky.

With Brine.

	Flavor.	Texture.	Color.	Salting.	Packing.	Total.
Maximum.....	45	20	15	10	10	100
Awarded	42	19	15	10	10	96

Flavor.—Sweet.

To ascertain the percentages of boracic acid in the milk, cream, buttermilk, and butter, twelve quantitative analyses were made. The results showed that the process of separation removed a considerable percentage of the acid, likewise the washing of the butter, and in no case did the boracic acid exceed 1 per cent. in the butter. This verifies past experiments. In practice preservitas or any other preservative along with common salt is rarely or ever added to cream by one person: but I have found both boracic acid and salt in cream that had been handled by several persons. Milk preservatives should always be dreaded by those engaged in dairying, and when used it should be done so very sparingly. In these experiments the quantities of boracic acid, which is the preserving ingredient in preservitas, are certainly excessive; but this was done purely for experimental purposes. These experiments will continue throughout the season on a more elaborate scale, when it is to be hoped that better facilities will be provided for the scientific work.

Fishy Butter.

Fishiness in butter, which is said to be frequently noted in our export consignments on their arrival in the London market, is responsible for heavy monetary losses to the dairying industry of Australasia.

With a view to the discovery of the cause of fishiness a great amount of scientific and practical work has been accomplished by this department, and much information has been gained; still we are not in a position to state the true cause of the taint. In New South Wales, however, the Dairy Expert (Mr. O'Callaghan) announces the discovery of a mould (*Oidium lactis*) which he claims to give rise to the trouble. Bacteriological experiments carried out in the Government dairy laboratory, and published in the *Journal of Agriculture* for October, 1900, illustrate a number of plate cultures showing *Oidium lactis* mould in factory milk, cream, butter, from the air of a milk-room, and also *Aspergillus* mould in factory water.

If the flavor of fishy butter be due to the effects of a mould, the fungus must be capable of growing at low temperatures. In former and in recently conducted experiments I have proved that fresh sweet butter acquires a fishy flavor after refrigeration, and in the tests the taint appeared to be of equal intensity throughout the individual boxes of butter affected. Preceding chilling, however, an evenly-distributed mould may be able to elaborate a substance which undergoes a chemical change by the action of cold, and at the same time may become equally pronounced in the body of the butter. In practical examinations made of fishy butter I have not been able to trace its influence to injury to either the texture or color of the samples.

It is peculiar that fishiness is little known in the local markets, and to my knowledge second-grade butter, which is shipped after many days from the date of manufacture, does not develop the taste before chilling. While testing a number of boxes of export butter, which were kept at temperatures varying from 32° F. to 50° F. for a period of three months, no trace of the complaint was found.

In the test recorded in this present issue it will be seen that a varying temperature did not appear to have an injurious effect upon the quality of the butter, but the extent of the work does not justify a conclusion being formed. It is apparent that more attention is wanted in the way of conducting tests of refrigerated butter with a special view to ascertaining the effects of varying temperatures. The study of butter when refrigerated is primitive, and little is known of the changes, chemical or bacteriological, which follow its action beyond the arrest of germ activity. With careful examination of butter before shipment, and again at London, much good would arise from a comparison of the results.

RABBIT DESTRUCTION.

Several inquiries have recently been made for reliable recipes for preparation of poisoned baits, &c., for rabbits. It is, of course, impossible to say any one method is the best, as so much depends upon local circumstances, conditions of feed, &c. What succeeds well in one district is often a partial failure in another. The following methods are selected from the many published of late years, and in each case have given very satisfactory results:—

Poisoned Water.

Arsenic.—Boil 8ozs. of arsenic and 2ozs. of washing soda in 5galls. water for twenty minutes, then add 45galls. of water.

Strychnine.—Cover 1oz. best strychnine with strong muriatic acid (spirits of salt) and let soak over night. Next morning dissolve this in $\frac{1}{2}$ gall. of boiling water and bottle. For use add 1pt. of the solution to 60galls. of water.

Cyanide of Potassium.—Dissolve 1lb. cyanide of potassium in 100galls. water.

Poisoned water is only of value when all other waters can be protected from the rabbits and domestic stock kept away from the poisoned water.

Poisoned Baits.

Arsenic.—1. To 5galls. boiling water add 8ozs. washing soda and as much arsenic as will dissolve, stirring well while boiling. When the arsenic has dissolved, add enough bran, pollard, or wheat to absorb all the liquid. 2. Mix thoroughly 1lb. arsenic with 5lbs. pollard and bran with sufficient water to make it stick together. 3. Moisten sandalwood or other twigs with water, then sprinkle with sugar and dust on powdered arsenic until the sticks are fairly white.

Phosphorised Pollard.—1. To 6qts. boiling water add one stick of phosphorus; stir well for about five minutes, then add 12lbs. sugar. When dissolved add pollard in small quantities until of a consistency of stiff paste. 2. Dissolve two sticks of phosphorus as above, add 4lbs. treacle instead of sugar, also thirty to forty drops of aniseed oil; make into stiff paste with 1bush or more of pollard. The aniseed is stated to be very attractive to the rabbits, and consequently adds to the effectiveness of the bait. 3. Take 4in. phosphorus stick, break into small pieces, and place in pickle bottle and just cover with bisulphide of carbon and water, which will dissolve the phosphorus and keep it in solution better than water. Have prepared a kerosine tin containing 2gails. boiling water in which 4lbs. sugar has been dissolved, to which the contents of the bottle must now be added, stirring well. Add bran or pollard or both until it forms a stiff paste. 4. To 1pt. of water in a bottle add one and a half tablespoonfuls bisulphide of carbon; break up small (under water) two sticks of phosphorus and add, allowing it to stand until dissolved. In an oil drum or other receptacle put 15pts. clean cold water; add the mixture from the bottle, pouring through a fine sieve to catch any undissolved phosphorus; then stir thoroughly, adding a few drops of oil of rhodium or aniseed. Add pollard until a thick dough is formed, stirring thoroughly all the time. Make into small pellets, sprinkling with dry pollard to prevent sticking. The addition of brown sugar prevents the pellets from drying up quickly and is more attractive to the rabbits.

Phosphorised Wheat.—This is prepared in the same way as phosphorised pollard, and a prominent authority states that no poisoned bait is more effective whether the grass be green and the feed abundant or dry and parched.

NOTE.—When prepared as above, the mixture should be kneaded well and then broken up into small pellets for distribution in newly-turned furrows, or about the buck heaps and other places where the rabbits frequent. Considerable difference in the quantities of the phosphorus used to, say, the bushel of bran or pollard exist. Some use one and a half sticks to the bushel, and others again as little as half a stick, and as the weaker and consequently cheaper mixture is stated to be thoroughly effective, nothing is gained by using the stronger mixture, which is more dangerous. With phosphorised baits there is always considerable danger of fires occurring unless great care is taken to have the phosphorus thoroughly dissolved, and to secure this the use of bisulphide of carbon is most desirable.

Strychnine.—1. Cover 1oz. strychnine with strong muriatic acid (spirits salts) and let soak until next morning; dissolve this in $\frac{1}{2}$ gall. of boiling water, then add $4\frac{1}{2}$ galls. water. In this soak twigs, and then coat them with a thin paste of flour, sugar, and water. 2. Boil 1oz. strychnine and 2ozs. tartaric acid in 1gall. of water; add 2lbs. brown sugar and a little flour, making a very thin paste; mix well. Add 2galls. hot water and boil for five minutes, stirring well. Dip in this sheaok, apple, or other twigs, cut apples, melon rinds, or any other stuff likely to attract; dry well before laying. 3. Dissolve 3lbs. sugar in 2galls. water; add 2lbs. flour and make into smooth paste. Dissolve 1oz. strychnine by boiling in half a pint of vinegar; mix all together and stir well. Dip twigs, etc., in solution. 4. Make a jam of apple, quince, or melon (using skins and all of the latter), and boil with half their weight of sugar until fairly thick. Then add 1oz. strychnine to 20lbs. jam, taking care to mix it thoroughly in order to secure an even distribution of the poison. Apples simply sliced and dusted with strychnine make good summer bait; 1oz. poison is sufficient for 25lbs. fruit.

Destroying Rabbits in Burrows.

Kerosine and Sulphur.—Saturate a piece of old bagging about 6in square with kerosine, sprinkle on it one tablespoonful of ordinary sulphur, place in burrow, light with a lucifer match, and push the rag as far down as possible.

Bisulphide of Carbon.—1. Saturate piece of cotton wool or waste with bisulphide of carbon, and force it into the burrow, closing the entrance at once. 2. Dissolve two sticks of phosphorus in a little less than $1\frac{1}{2}$ pt. of bisulphide of carbon in a bottle; add half a pint of water, and close. Carry the bottle carefully, and do not shake roughly. Catch a rabbit, attach to its leg a rabbit skin saturated with about two wineglassfuls of the mixture. Let the rabbit go in the burrow. The skin will soon break into a blaze, the smoke coming out in thick volumes from any unclosed outlet. In a little while send down another rabbit from a separate entrance, and an explosion will result, killing all the rabbits in the burrow. This cannot be safely done where there is dry grass or other inflammable matter near the burrows, and the greatest care must be taken that the rabbit does not escape, as it would carry the fire in all directions. 3 Saturate cotton waste with bisulphide, and push it as far down the burrow as possible. After it has remained a few minutes, some people push down a stick on which is a piece of lighted oiled waste into the burrow, when the fumes of bisulphide explode, and it is said this makes it more effective; but there is danger in the practice.

It is, of course, necessary when dealing with the rabbits in the burrows that all but the openings to be operated on be first closed, in order to prevent the escape of the rabbits or the fumes. If the surrounding country can be first hunted well with dogs, more success will be attained, as the rabbits will seek shelter in the burrows.

CULTIVATION OF MALLEE LANDS.

In a report to the Minister of Agriculture in Victoria, Mr. F. J. Howell, Scientific Instructor in Agriculture, writes:—"The average wheat yield of the Mallee, as we know from the returns just published by the Government Statist, is a little over 4bush. per acre. The average of the Birchip district did not, I think, exceed this, and possibly fell below it. Mr. Small, living at Narraport, a few miles away, succeeded, however, by fallowing and proper cultivation, in raising his yield to the magnificent average of over seven bags to the acre. In a communication to me, Mr. Small gave details of his system of working his land, and the crops he obtained, together with the crops obtained on adjoining ground, where other systems of soil preparation had been followed. The facts are of such significance that are worth posting on every highway throughout the State. Mr. Small writes:—"The land (for fallow) was ploughed in August and September, and harrowed as fast as ploughed. The harrowed ground was brought to a fine tilth later on in the season by log (six horses), instead of a roller, across the furrows. After the first shower the ground was harrowed again, and just before harvesting the disc was put over the ground, and the logging process repeated. The harrows were used after every shower of rain during the summer, and just prior to sowing, about the middle of April, the ground was again harrowed, and the seed drilled in at the rate of one bag to seven acres, with $\frac{1}{2}$ cwt. of superphosphates."

"There are two kinds of soil on Mr. Small's property, a sandy loam with a retentive clay subsoil, found on the greater portion of the farm, and a black loose soil of great depth. In referring to the returns, Mr. Small writes:—"The sandy loam sown with Red Straw wheat went a little over seven bags to the acre. The black loose land sown with Allora Spring returned about five bags to the acre. Land adjoining, fallowed, drilled, and manured, but not treated (worked) as mine, returned three bags to the acre, and land fallowed in the ordinary way, and sown broadcast without manure, and sown with a late wheat, gave better returns than the last field mentioned, as the late showers benefited this wheat.'"

CULTIVATION OF OSIERS.

The Board of Agriculture have extracted the following information relating to the cultivation of osiers in the Fen districts from a report by one of their Land Division Inspectors, who undertook a special inquiry into the subject in the year 1893:—

The term osier is popularly used as comprehending all the trees or shrubs of the *Salix* genus which are cultivated as a crop to be converted by the basket-maker and similar craftsmen into various articles which are known as wicker work. The genus *Salix* includes willows, sallows, and osiers. Most of the kinds grown for a crop in the Fen districts are, it is stated, really willows, and not osiers.

Osiers are grown in enclosed plantations, which are locally known as holts. The produce of the osier holt is known commercially as "rods."

Green rods are fresh cut and unpeeled.

Brown rods are those which have been left to dry in their skins.

White rods are those which have had the bark removed or peeled.

Buff rods are produced by boiling brown rods and then peeling them; but the color thus produced is imitated by dyeing.

In the Fen district osiers are chiefly grown along watercourses, on land which is subject to flooding. A variety of circumstances contribute, perhaps, to this situation being almost universally selected. It is not merely that this

is the natural *habitat* of the genus, and that the soil is suitable, but the convenience of having close at hand water carriage for a bulky and heavy crop, which must be for the most part removed in a green state, has no doubt tended to restrict the growth of osiers almost entirely to the neighborhood of rivers. An additional reason for the selection of such sites is, that the periodical winter floods bring down from the uplands a considerable quantity of soil which acts as a fertiliser. Floods, however, are occasionally the cause of considerable injury to the holts. An ice flood cuts the rods and seriously damages them. Sheet ice settling down on the holt will entirely destroy a crop, and a spring flood which covers the young shoots will kill them; but freshets, which disappear quickly and which do not rise above the tops of the rods, do no harm.

The most suitable soil for the growth of osiers is a deep, rich, moist, alluvial soil. Any good clay may be planted if sufficiently moist. Peat, moor, and hot gravels, are absolutely unsuitable. Though water is requisite, a holt will not thrive in stagnant water.

The site of a holt having been selected, the land must be thoroughly cleaned during the summer before planting, and it may be worth while to give it a complete summer fallow. Before the winter sets in it must be thoroughly stirred, either by digging or ploughing, to a depth of 14in. or 16in.

If the soil is not naturally rich, it should be manured, and soot is said to be a good preparation for the crop.

Planting should be done in February or March. The sets are cut from wood of two years' growth—they should be 16in. or 18in. long, and about 10in. of the set should be in the ground. During the spring and early summer the spaces between the rows must be kept clean by hoeing and forking. The cleaning must be completed before the middle of June, or the osiers will be injured. The cost of cleaning is variously estimated at from £1 to £2 per acre per annum for the first two years. After that time the expense of cleaning is much less, as the dense and rapid growth of the osier stifles and smothers all other vegetation. It may be mentioned in passing that the young shoots from an established stock will make a growth of 18in. in the course of a single week.

Under the most favorable circumstances the newly-planted holt will be at maturity after a period of three years, but as a general rule four or five years must elapse before its full development.

A holt properly planted, kept clean, regularly filled up, and well managed will last from ten to fifteen years, the duration depending upon the sorts planted and upon various circumstances which affect the several kinds of osiers in different ways.

The willows and osiers usually grown in the Fen district are known locally by names indicative either of some characteristic of the tree or of the country from which it has come. The favorite sorts are:—

Glibskins.—In some situations this kind is particularly liable to “scab.”

Black Mauls.—Small, but hard and tough, and consequently valuable.

Green Sucklings.—A heavy cropper, but not liked by the basketmaker.

Welsh Osier.—This has a very bitter rind, which is disagreeable to all animals; it is planted on the outsides of holts.

Black Hollanders, Mottled Spaniards, Cane Osiers, and Dutch Red.

Most of these have been botanically determined at the Royal Gardens, Kew. Cuttings of a dozen kinds were obtained from a practical osier grower in Hunts; and it was found that Glibskins, Black Mauls, Green Sucklings and Black Hollanders were all varieties of *Salix triandra*. The Welsh Osier is known botanically as *Salix purpurea*, the Mottled Spaniard as *S. decipiens*, and the Cane Osier as *S. viminalis*.—(*Kew Bulletin*, 1896, p. 143.)

A certain proportion of the coarse-growing osiers may be grown, as the

basketmakers require some strong stout rods for uprights; where they are not grown their place is supplied by leaving a portion of the holt to grow for two or three years.

The osiers attain to their full growth by the middle of September. They will make an average growth of 8ft. or 9ft., and, occasionally, as much as 13ft., in a single season.

Cutting the rods commences with the new year, if the holts are accessible. Sometimes, however, floods or other circumstances prevent the early cutting, and the process has to be postponed. It is, however, considered very desirable to cut before the sap rises, as the stocks bleed, and the new growth is less vigorous, if the sap has risen before cutting. The rods are cut with a sharp hook, somewhat like a strong reaping hook; a clean cut, without splitting the rod, is essentially necessary. As the rods are cut, they are tied up by willow bands into bundles or "bunches." Each bunch has a girth of 45in. (an English ell) at a distance of 1ft. from the butt end of the bunch. The "ell band" is secured in its place by attachment to another band, called the "breach band," round the butt end. A third band is placed higher up. An average crop will be about 150 bunches per acre, and a heavy crop will reach to 250. A green bunch will weigh 6st.

It has already been observed that it is a great advantage if this bulky and heavy crop can be removed by water carriage.

When the rods are to be peeled, they are conveyed to the peeling yard and placed with their butt ends in water, where they remain until the rise of sap makes the peel separate easily from the stick. Sometimes after the rods are cut they will dry from exposure to the air, and in that case they are put in a heap, watered, covered up, and sweated, or "couched" as it is called. If the rods in the pits get too advanced in growth before peeling, the difficulty of peeling is increased, and the rods are damaged. The work of peeling begins as soon as any of the rods are fit. It is chiefly done by women, who draw the rods through a "break" or "cleave." This divides the bark into strips, which are removed by the hand. The children of the peelers assist in this latter operation.

As the rods are peeled, they are sorted into three grades, "large," "Middlesboro," and "small" rods, according to their size and length. They are then exposed to the air for a short time on racks, or reared against hedges or walls. When dry they are tied up in bunches of the same dimensions as before, and stored away in sheds.

Rods which are adapted for the purpose, and which are, in consequence, most valuable, are subjected to another process known as "skeining." This is the longitudinal division of the rod by splitting it into equal parts. The thick end of the rod is nicked with a knife, dividing the circle into three sections. A triple wedge is then inserted, and the rod is drawn rapidly through the hand. The split rods are then drawn twice under a knife fixed to a gauge to remove the outer ring and inner angle, and the rod is reduced to a flat thin strip of equal thickness. These "skeins" are used for weaving sieve and riddle bottoms, and for making basket handles and similar articles. Green rods are "skeined" by the same process, for making eel grigs, hives, &c.

Hitherto the ordinary practice of most growers has been to sell the rods, when cut, to persons who peel, sort, and store them.

Information relating to the cultivation of osiers will also be found in articles by Mr. W. J. Cochrane in the Journal of the Highland and Agricultural Society of Scotland (5th Series, vol. v., 1893), and by Mr. E. J. Baillie in the Journal of the Royal Agricultural Society of England (3rd Series, vol. v., 1894); and attention may be directed to their remarks as to the suitability of sewage farms for the growth of osiers.—*Board of Agriculture Leaflet.*

POULTRY NOTES.

By D. F. LAURIE.

Poultry Shows.

New South Wales is again to the front in poultry matters in that the recent table poultry show was not only a success as a show, but also as a means of educating breeders up to the correct standard required in all branches of the trade. I have for years urged that more prominence should be paid to table poultry at all our agricultural shows, and consider that much money that is now devoted to many matters which really do not come within the scope of agricultural shows should be devoted to eggs and poultry. Few are aware of the respectable total of our export of eggs, and the average person attaches little importance to an industry that not only represents a great deal of money, but is also of interest to the greater number of South Australians. Most people are interested either in the purchase or sale of poultry and eggs—they are either producers or consumers. The purchasers wish to get good value for their outlay, and the sellers look for a profitable market. I have this week a letter from a country breeder who states that he can only get 1s. 3d. for good fat fowls, averaging 6lbs. weight, and that the average his neighbors receive for much inferior birds is 1s. Now, this breeder is within a few hours by rail of the city. I was present when a cooked fowl, weight about 3lbs., was purchased at a restaurant for 3s., and was assured that birds were so scarce that very high prices were ruling. I was told that dressed fowls of this description were selling at 2s. 6d. each. Compared with a fair table cockerel of an approved cross, say, four or five months old, weighing, say, 5lbs., this old 3lb. hen was a costly purchase. Judged by quality and weight the cockerel should be worth about 5s. The actual value is less than half that. My advice to all breeders in a given neighborhood is to co-operate, appoint a city salesman, and send guaranteed birds and eggs. My correspondent further stated that had he sufficient numbers he would have sent to the dépôt for export. This is another argument in favor of co-operation. The salesman could use his discretion, after grading each consignment, what to sell locally and what to send forward for export. Any Adelaide salesman would doubtless welcome the chance of dealing with prime table birds, and guaranteed fresh eggs, which would be better if infertile. I see that the number of birds at present being received at the Government Dépôt in Sydney bids fair to reach a record total this season. Poultry of all sorts commands a higher price in Sydney than here, so if it pays them to ship it should be more satisfactory still to our local breeders. Since the inception of the Victorian export trade the Melbourne Dépôt has forwarded £19,000 worth of poultry, and we have fallen very far short of that.

The recent table poultry show in Sydney was assisted by the Government to the extent of £25, and all the awards were made by Mr. George Bradshaw, the Government Poultry Expert. Mr. Bradshaw knows his business well, and the proof came after the judging. There were many "know-alls" who considered that certain pairs (the birds were exhibited in pairs) in the live bird sections were wrongly judged. At the conclusion one of each pair was killed and dressed, and in each instance Mr. Bradshaw's awards were found to be correct in every respect—the better quality of flesh and meat, the superior shape and appearance amply testifying. In every way the exhibits and their treatment formed a great educational medium, and hundreds of visitors gained valuable knowledge of breeds and the appearance desired in first-class table poultry.

The South Australian Government has assisted the two chief poultry societies here in the matter of special prizes to encourage breeding the most suitable

varieties for utility purposes. As a result breeders were stimulated to procure and breed good stock, which in due course spread to the country breeders, and we are now seeing a gradual improvement and hope for much more. Many country societies hold autumn shows, when table poultry should be the feature; not show birds, which at this season are moulting and out of feather. It would be a step in the right direction to devote the prize money to a few classes with such prizes as would induce farmers and others to pay attention to breeding suitable birds. It is my experience that only a few fanciers who pay high prices for their stock benefit by the present system. As agricultural shows are at present constituted no other than utility birds have a right to the funds as prize money. It will require some effort to change matters, but when the change does come it will benefit the poultry industry far more than the present shows of fancy birds. As show birds the greater number of exhibits at most country shows are of poor quality; as stock birds for breeding good table birds or for increasing the egg yield they are all right. A good deal has been done in the matter of advising as to breeds, now we want to see actual results and a good export trade established. These are my views, arrived at after years of close study, and I speak from actual experience and also from the knowledge of what is done in other States and the expressed opinion of many breeders. The columns of the *Journal* will reach many who have written to me on this subject, and I can give fuller reasons than in individual replies. Much more remains to be done in improving various breeds, and it is to be hoped that, in time, certain breeders in each centre will breed high-class birds for distribution. Cattle are being improved in such a manner, and why not all other stock? By combination the purchase of a few good birds would cost the individual very little.

Moulting.

As a rule during the moult—one of the critical periods of poultry life—the birds are left to their own sweet ways, and are allowed to get through anyhow and unaided. As a natural consequence the operation is protracted and the birds remain unproductive for a lengthened period; in fact, it is often well on in spring before the hens and pullets are laying. The strain on their system caused by casting the old feathers, the necessary exposure to all weathers, and then the growth of the new plumage, is very severe and weakening. There are many inexpensive aids to the process, and a little extra attention expedites matters and the birds are soon in full health. It is of great importance to get the birds through the moult as early as possible; in fact, that is part of the secret of success in egg-production during the period when prices are high. Cleanliness is most important; so is proper housing—a semi-denuded bird sleeping in a draughty house is liable to colds and worse consequences. Feather-forming food should be provided, and a general change of diet is indicated. A little sunflower seed twice a week is a great aid. Sulphate of iron in the drinking water, and once a week on following days give to each twenty fowls a teaspoonful of flowers of sulphur and a teaspoonful or a packet of Epsom salts dissolved in the water used for mixing their soft food. A dust bath is greatly appreciated by fowls, and at moulting time assists the casting of the old feathers and the growth of the new, as well as dislodging all vermin. Roup and other diseases are constantly reported to me of late; the weakened system, due to the drain of moulting, renders poultry liable to the attacks of diseases which in health they would successfully withstand. Many cases result from neglected colds assisted by insanitary conditions. Roup is less dreaded nowadays than formerly, because it has proved amenable to modern treatment. Prevention is better than cure. I am strongly of opinion that stock bred from birds which have recovered from a severe attack of roup are tainted; they are very prone to the development of cankerous growths. I am not in favor of poultry spices and egg foods; all are

expensive and many are injurious. In case of colds, and during changeable and wet weather and in the moulting season, a teaspoonful twice a week to each twenty fowls in soft food of the following tonic powder may be given:— Mix equal parts of powdered aniseed, fenugreek, liquorice, and ginger; all should be quite fresh, are cheap, and can be ordered from any chemist. Keep in stoppered bottles, and do not stock too much at a time. Powdered boracic acid is good for canker, ulcers in the mouth, and for diphtheritic growth in the eyes; so also is a solution of chlorinated soda. Make a rule of isolating any bird on the appearance of any symptoms of sickness; many diseases are contagious or infectious, and the flock may be affected. As soon as the moult is over no time should elapse before required stock is purchased and all surplus birds marketed to the best advantage. All birds past their days of usefulness should be dealt with; none but profitable birds should be kept. Far better have a flock of twenty good layers than 100 bad ones with three or four layers among the lot.

Canning eggs was mentioned the other day as a new American industry; it has long been practised in Russia, and during the time I was lecturing I used to explain how, after carefully testing each egg, and then breaking each separately into a receptacle, the yolks were placed in one can and the whites or albumen in another, and in other cans both were mixed. The cans varied in size, and all the larger ones were provided with a tap, so that a given quantity of the contents could be drawn off. Infertile eggs could, no doubt, be easily preserved in a similar manner, using patent jam tins, and filling in the top with melted beeswax.

Early Chickens.

The question is often asked as to the earliest that chicks can be successfully hatched. I find that as soon as the extreme heat is over, say after March, good results will follow. Select the eggs of hens laying after the moult rather than those of a hen terminating a long season of productiveness, as such eggs, if fertile, contain germs deficient in vitality, and the resulting chicks will fail in many ways. If the birds are well forward by May they will go well through the cold and wet winter months; after that it depends on surroundings. Cold, bleak situations mean spring hatching, and consequent late chickens; the early ones pay best in every way.

DEMONSTRATION PLOTS.

BY PROFESSOR LOWRIE.

Manuring.

These plots were laid out on part of the land purchased in 1899 from Mr. Ebsary, and on a block which had been fallowed in the summer, shortly before the date of our purchase. As we wished to crop the whole of this farm in the same year, we ploughed it again in August to bring it into line with the other fields purchased. This increased working—really two-fallowing—enabled the unmanured blocks to yield to much better advantage relatively to the manured blocks than is generally the case, but the results demonstrate that, even on land which has had what is to be considered exceptionally favorable cultivation, the intelligent use of artificial manures is justified. It has also to be mentioned in view of the results that the blocks on which soluble phosphatic manures were used were affected adversely by the character of the season. These manures hasten the maturity of the crop and the wheat came into ear earlier than on the plots treated with less soluble phosphates and those left unmanured. As it happened there came a burst of very severe, hot, drying

weather just as these earlier plots were in bloom or beginning to fill, and accordingly the yield suffered somewhat, and the advantage of these soluble manures is less marked than in an average season it would have been. From reports I have noted in the daily newspapers, and from current rural rumor, I have formed the opinion that very hasty and ill-informed generalisations have been made relative to this more or less accidental circumstance, as it has affected the manured land in several districts of the colony. Men do not seem to have recognised the facts—(1) That wheat, while in bloom, is extremely sensitive to sudden or extreme weather changes; (2) that on the lands manured, through ripening earlier, the crops were exposed to this burst of severe heat in their most sensitive period, and that they ripened off too suddenly in consequence; (3) that the unmanured lands escaped through the crop being later in coming into ear and in blooming; (4) that the chances of this sun-scalding are less for the early than for the late crops, though in this year the earlier suffered; and (5) that it is a grave error to generalise from the results of any one year, and to speak of what is the result of climatic accident as a danger in the use of manures. Had that hot weather prevailed a fortnight or three weeks later, the effect of it would have been marked on the unmanured lands.

As it turned out, however, the results on these plots amply justified the use of manures, and almost invariably throughout the State those who hastened to condemn the use of manures when the effect of the hot weather was first noticed have had reason to cut short their jeremiads when the wheat was being bagged.

It has also to be pointed out that the land improved slightly as one passed from the first to the last plot. Slight changes in the quality of the land cannot in this district be avoided when one is dealing with a block of thirty acres or more, and I am satisfied that the results are more reliable than if the plots had been smaller.

The outstanding lesson which these results teach is a repetition of that of former years—that superphosphate of lime is the manure most profitable for this land and our conditions. In this relation, compare plots 2 and 6, plots 12 and 13, and plots 22 and 26. Further, they tend to show that the use of nitrogenous or potassic manures is unprofitable, or at least much less profitable than the use of phosphatic manures. Compare plot 30 with plot 31. The cost of the added $\frac{2}{3}$ cwt. sulphate of ammonia is about 9s. per acre; but for this outlay an increase of less than 2bush. is all the immediate gain.

The results of plots 27, 28, 29, and 30 deserve, in view of the prevailing practice among our farmers who use manures, of applying only very light dressings—80lbs. to 1cwt. per acre—careful consideration. I have contended for some years that heavier applications than are used would increase our returns, and that profitably, and this year again the results of our experiments confirm the contention. Thus 1cwt. superphosphate gives an increase of 3bush. 14lbs., $1\frac{1}{2}$ cwt. an increase of 5bush. 34lbs., and 2cwt. an increase of 9bush. 50lbs. I will tabulate these results, valuing the wheat at 2s. 6d. per bushel:—

No.	Manures.	Yield.	Value of Increased Yield.			Net Gain.		
			£	s.	d.	£	s.	d.
27	No manure	20bush. 26lbs.						
28	Lawes' super., 1cwt.	23bush. 40lbs.	0	8	1	0	3	8 $\frac{1}{2}$
29	“ “ $1\frac{1}{2}$ cwt.	26bush.	0	13	11	0	7	4
30	“ “ 2cwt.	30bush. 16lbs.	1	4	7	0	15	10

Why, one asks, should many farmers be content with the lower net gain, when the higher is practicable under the climatic conditions of their district?

Total Rainfall for the Year = 19·60in.

Plot.	Kind of Manure.	Quantity per Acre.	Yield per Acre.	
			bush.	lbs.
1	Lawes' superphosphate, 38 per cent. to 40 per cent. (Elder, Smith, & Co., Limited)	2cwts.	24	46*
2	Lawes' superphosphate, 36 per cent. to 38 per cent. (Elder, Smith & Co., Limited)	2cwts.	26	48*
3	Lawes' Peruvian guano (Elder, Smith & Co., Limited)	2cwts.	25	52
4	Lawes' dissolved bone compound (Elder, Smith and Co., Limited)	2cwts.	23	42
5	Lawes' vitriolised bones (Elder, Smith & Co., Limited)	2cwts.	24	27
6	Lawes' special corn and potato manure (Elder Smith & Co., Limited)	2cwts.	24	17*
7	Lawes' potato manure (Elder, Smith & Co., Limited)	2cwts.	23	58*
8	Rape meal, 6½ per cent. nitrogen (Gibbs, Bright and Co.)	2cwts.	27	7
9	Rape meal, 5 per cent. nitrogen (Gibbs, Bright and Co.)	2cwts.	25	19
10	Rape meal, 1cwt. + Lawes' superphosphate, 2 cwts. =	3cwts.	20	43†
11	Rape meal, 5 per cent. nitrogen, 1cwt. + Lawes' superphosphate, 2cwts. =	3cwts.	22	36†
12	Bally Bonedust (A. R. B. Lucas & Co.)	2cwts.	24	17
13	Complete manure (Adelaide Chemical Works)	2cwts.	27	14
14	Superphosphate (Adelaide Chemical Works)	2cwts.	31	45
15	Superphosphate B (Adelaide Chemical Works)	2cwts.	27	17
16	No brand (Adelaide Chemical Works)	2cwts.	23	5
17	Guano superphosphate (Adelaide Chemical Works)	2cwts.	24	23
18	Alkali Co.'s superphosphate (Geo. Wills & Co.)	2cwts.	26	38
19	Alkali Co.'s dissolved bones (Geo. Wills & Co.)	2cwts.	25	30
20	Alkali Co.'s grain manure (Geo. Wills & Co.)	2cwts.	25	49
21	No manure	—	19	41
22	Thomas phosphate (F. H. Snow & Co.)	2cwts.	21	47
23	Thomas phosphate, 2cwts. (F. H. Snow & Co.)	396lbs. of mixture	23	0‡
	Muriate of potash, 1cwt. (F. H. Snow & Co.)			
24	Nitrate of soda, 60lbs. (F. H. Snow & Co.)	284lbs. of mixture	22	9‡
	Thomas phosphate, 2cwts., + nitrate of soda, 60lbs. (F. H. Snow & Co.)			
25	Thomas phosphate, 2cwts., + muriate of potash, 1cwt. (F. H. Snow & Co.)	3cwts. of mixture	23	35‡
26	Continental superphosphate (Snow & Co.)	2cwts.	31	34
27	No manure	—	20	26
28	Lawes' superphosphate	1cwt.	23	40
29	Lawes' superphosphate	1½cwts.	26	6
30	Lawes' superphosphate	2cwts.	30	16
31	Lawes' superphosphate. 2cwts., + sulphate of ammonia, ½cwt.	2½cwts.	32	8

* Lodged in places. + Too rank—very badly lodged. ‡ Germination injured.

PICKLED FIGS.—Perfectly ripe, but not soft, figs can be pickled in exactly the same way as onions are done, and they are very nice.

GRAPE JAM AND JELLY.—Grape jelly is made by straining the juice of grapes through a jelly bag, retaining the seeds and pulp. Then boil the juice down with the best cane sugar till it jellies when a little is put on a plate. The pulp can be used for jam-making. Grape jam is made by stewing grapes till they become a soft pulp, when they are strained through a sieve. Allow a pound of sugar to every pound of fruit, boil twenty minutes, with constant stirring, and then pour the jam into jars.

FARM HINTS FOR MARCH.

BY THE EDITOR.

Indications seem to favor the hope that we shall have heavy early rains, which will beat down the old grass and make feed scarce for a short time. Farmers who have stubble land which is to be left out of cultivation for a season would do well to clear a few acres and scarify in about 2lbs. each of White mustard and Early Essex rape, which will grow quickly and become very acceptable to the hungry stock.

Pigs intended for slaughter should be penned up soon and be fed upon milk, meal, grain, peas, or other hard feed. Do not give slush or green feed of any kind for next ten or twelve weeks. Sows should not be slaughtered till a fortnight after "season" is past.

In order to improve the dairy herd only the purest breed of bull from a good milking strain of dairy breed should be used. Never employ a half-bred or mongrel bull, or one that does not come from a good family of milkers. Unless the mother is also a pure-bred dairy cow, do not save the bull calves; but the heifers should be well fed and well cared for. If the bull is introduced to the herd now the cows will come into milking in the summer, when their produce is of the most value. Do not forget to prepare some land on which to grow fodder for the summer maintenance of the cows.

There are still several haystacks unthatched and unprotected. Heavy rains may soon fall, and the owners of those stacks will ask for the sympathy of their more provident neighbors.

Keep the boars separate from the sows, as it is neither good for the sows nor their offspring to have litters coming forward during the first cold of winter. Provide warm, clean, dry quarters for all the pigs, and keep the breeding stock in ordinary fair working condition. It will not pay to let the animals get down in strength.

Next month in the earlier districts is the time for sowing peas, beans, tares, or vetches, mustard, rape, rye, and barley for fodder crops. The land must be well prepared now. Of course some small lots should be sown now for first feed, but the main crops should be sown during the next eight weeks.

Look out for some good strong Merino sheep to clean the fallows and eat up the old feed on the farm. It will pay everyone to keep some sheep if he has a farm.

Grasses, clovers, &c., should be sown next month. There is no doubt that bonedust, super., and other phosphatic manures beneficially affect the forage and the animals that feed upon it. Wherever wheat crops have been fertilised fairly heavily with phosphatic manures it is noticed that the live stock prefer the stubble even to grasses, and in some cases they appear to become stronger and more healthy after feeding on such lands.

It is worthy of consideration whether the land that last year produced a cereal crop will be beneficially affected by the cultivation of a leguminous crop this season. Peas, beans, &c., will probably pay for the trouble of growing, and it is generally conceded that the soil is enriched in nitrates by a crop of pulse.

Sow some kail, cabbage, or other similar crop in a seed bed for planting out in spring to provide summer green feed for the live stock. Sow a small bed of turnips in the field.

In many places potatoes can be grown, and may give profitable crops if the early frost does not cut them off.

The fallows should be well cleaned at once, first by feeding off weeds by sheep, and then by scarifying or shallow ploughing. Every weed growing amongst a crop occupies the place of a desirable plant and robs a circle around.

MILDURA NOTES.

The busiest period of the year, that of raisin-drying, is upon us. The weather, which in the early part of the month was very variable and uncertain, and seemed to promise a very bad drying season, has so far (February 25) proved excellent for the purpose required. The fruit is not drying very quickly, but in color and fleshiness it is said to surpass the average for years.

Currants are all dried, and for the most part stemmed and graded. In many instances a ton to the acre yield is claimed. Sultanias are still on the trays in some instances, though stemming has commenced in others. Of the magnitude of the Gordo raisin yield some conception may be gained from the fact that one firm alone is drying 150 tons, equal to nearly 500 tons of fresh fruit. At this drying ground thirty hands are employed, over 20,000 trays are in use, and the spread of the trays covers eight acres. Such a sight could not fail to impress a visitor with a sense of the resources of Mildura. And to what, under federation, may not the dried fruit production grow, seeing that the value of our total output as yet only equals a fifth of the consumption in Australia.

Few things have impressed the writer more than his happening upon the drying-ground above alluded to while driving sheep from the Murrumbidgee two or three years ago. The extent of trays of raisins seemed interminable. A few pounds more or less seemed a little matter; no one was in sight save a cyclist in the dim distance beyond the trays; it was the close of a sweltering day, and the "weary wanderer" failed not to take a big refreshment from a tray of grapes just spread. After a three weeks' journey in the mallee, even a little caustic soda on the fruit seemed but to add zest to one's craving for it.

Drying started earlier than would have been the case but for uncertainty about the weather holding fine, and there will probably be very little of the first crop left unpicked by the end of February.

The dried apricots are selling freely and at satisfactory prices in spite of fears lest the output this year of nearly 200 tons should seriously depress the market. This total was reached despite the fact that larger quantities than usual of this fresh fruit were bought for canning.

The effect of high prices for fresh fruit, on the other hand, was to considerably reduce the quantity of peaches reserved for drying. The Mildura dried peach is a distinctly superior article, but the public has not yet recognised its merits as it has done in the case of apricots. Merchants bought freely last year, but sales are not expected to be very brisk for this season's product.

The second and main crop of figs is drying much better than was the case last year, the fruit being much fleshier and apparently more thoroughly fertilised. Local buyers are paying from £4 11s. per ton fresh and 3d. per pound dried in the sweat box.

The almond crop is smaller than usual, but sale prospects are good.

The lower river has remained open throughout the month for small craft as far up as Wentworth, and large quantities of fruit have been dispatched by teams near that town.

The fourth and final pumping for the season started on February 24. This pumping is arranged to serve the citrus blocks, lucern patches, and land intended for hay. Very little is taken for any other purpose. Last season there was no water available for crop lands, owing to the excessive lowness of the river imposing too severe a strain on the centrifugals at Psyche Bend pumping station, where the water is lifted from the river into the billabong. No such difficulty is anticipated during this pumping, as the river is higher by 1ft. 6in. than at the corresponding period in 1900.

There has been a good supply of labor available throughout the fruit season. More and more Mildura is becoming, at this time of the year, a rendezvous for the nomads of the Australian bush. They gather in from every point of the compass for a few weeks' work, at 5s. or 6s. a day, with the additional attraction of a good supply of fruit.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

March 1, 1901.

Dry weather has permitted the gathering in safely of the last of the grain crops in the late districts, and vignerons are now commencing operations with every prospect of securing a good vintage both in quantity and quality. Until the closing days of the month no rain or any consequence had fallen in the older agricultural districts, but the far northern and western pastoral runs have benefited by monsoonal disturbances during the past couple of weeks, and, what is of as much consequence to the prosperity of this State, the threatened water famine at Broken Hill, which in a week or two must have shut down some of the mines there (throwing out of employment thousands of men), was averted by a most opportune downpour.

Business has been fairly active, the heavy crop of wheat raised this season, that has to be shifted during the next few months, making things brisk in anticipation in the railways, shipping, and other directions.

In the grain trade inanimation characterised the month's operations, and shippers of wheat declare they are doing trade without any profit, although sellers in our market at moment are not inclined to accept prices offered by buyers. Local millers continue to purchase their requirements somewhat sparingly; in fact, no one seems to have any great faith of improvement in the price of breadstuffs in the near future. Flour is dull, and it is probable millers would be prepared to concede somewhat on their quotations to quit parcels. Oat lines have been very lively, with strong demand for both bran and pollard from Western Australia, whilst South Africa is also still a buyer of bran. In forage lines values are unaltered in hay and chaff, but feeding grains are decidedly weaker, though to secure a parcel of local oats or barley prices would be easily affected.

A somewhat unexpected shrinkage in the local supply of potatoes created a renewed demand for these at Mount Gambier, where, however, ripe samples are yet scarce, and this at moment is causing values to advance here, although in the neighboring States prices are drooping. Crops of the favorite tuber are likely to be very light in our leading district—Mount Gambier; but, against this, larger areas are under crop within a radius of forty miles, chiefly in a southerly direction from the city. Onions have well-sustained in price, but are becoming more plentiful, as offerings are being made from the South-East, where usually growers have not commenced selling at this time of year.

The absence of rain in the dairying districts continued the shrinkage in milk production, so that to keep pace with the market requirements in butter heavy importations are being made, chiefly from Victoria and New South Wales. Increasing quantities of cream are also reaching this city overland from the western district of Victoria, so that at moment supplies in butter are fully equal to demand, imported bulk selling here at a shade below cost, taking present Melbourne quotations as a basis. Our dairy folk are anxiously hoping for a good soaking rain soon to ensure ample winter feed for their cattle. If this should occur, a few weeks would soon see this State again supplying its own wants, at least, in butter. The expected upward movement in price of eggs appeared, so that values are now ruling quite up to the average at end of February. The heavy demand we reported in our last for cheese and bacon led to further advance in quotations for these, and there is good trade doing in both lines. Honey displays a little life after some months of inactivity, but values still rule very low. New almonds are reaching market, but hardly yet in sufficient quantity to gauge supply or probabilities of the season's price.

Heavy supplies of poultry have been coming forward during the month, but demand readily absorbed everything, although small and poor fowls purchased for fattening purposes were over-plentiful, so that values for these suffered for a time, but have since recovered. Good, fit table stuff, however, has continued to sell readily at full rates, the comparatively high price of butchers' meat this season causing greater demand for feathered meat.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide, 2s. 7½d. to 2s. 8d.; outports, 2s. 6d. to 2s. 7d. per bushel of 60lbs.

Flour.—City brands, £6 5s.; country, £5 15s. to £6 per ton of 2,000lbs.

Bran.—10½d.; pollard, 10½d. to 11d. per bushel of 20lbs.

Oats.—Local Algerian, 1s. 7d. to 1s. 9d.; ordinary stout feed, 2s. to 2s. 2d. per bushel of 40lbs.

Barley.—Malting, 2s. 10d. to 3s. 4d.; Cape, nominal at 2s. per bushel of 60lbs.

Chaff.—£2 12s. 6d. to £3 per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.
 Potatoes.—New locals, £4 10s. to £5; Gambiers, £4 8s. to £4 10s. per 2,240lbs.
 Onions.—Locals, £4 10s. to £5 per 2,240lbs.
 Butter.—Creamery and factory prints, 1s. 1½d. to 1s. 4d.; private separator and best dairy, 1s. to 1s. 2d.; store and collectors', 9½d. to 11d. per pound.
 Cheese.—S.A. factory, 7½d. to 8d. for best; medium to good, 6½d. to 7d. per pound.
 Bacon.—Factory-cured sides, 7d. to 7½d.; farm lots to 6d. per pound.
 Hams.—S.A. factory, 8½d. to 9½d. per pound.
 Eggs—Loose, 10½d.; in casks, f.o.b., 1s. per dozen.
 Lard.—In bladders, 5d.; tins, 4d. per pound.
 Honey.—2d. for best extracted, in 60lb. tins; beeswax, 1s. 1d. per pound.
 Almonds.—Soft shells, 4d. to 5d.; kernels, 11d. per pound.
 Gum.—Best clear wattle, 2d. per pound.
 Live Poultry.—Nice table roosters, 1s. 7d. to 2s.; heavy weights, up to 2s. 3d.; light cockerels and fair hens, from 1s to 1s. 5d.; a few pens of chicks, 10d. to 1s.; coops of small ducks, from 1s. 4d. to 1s. 7d.; full-sized table birds, 1s. 9d. to 2s. 1d.; geese 2s. 5d. to 3s. 2d. for medium to fair; pigeons, 5½d.; turkeys, from 6½d. to 9½d. per pound, live weight for fair to good table birds.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

WEATHER AND CROP REPORTS.

ARDEN VALE.—The average for the hundreds of Yarrah and Wyacca was 3bush. per acre. Total rainfall for 1900, 10·80in.

BAKARA.—The weather has been hot and dry. Feed is scarce, but stock, &c., in fair condition.

BALAKLAVA.—The principal occupations of farmers at present are burning scrub and water-carling. Rain water is getting scarce. Starlings are numerous and are very destructive. They are considered worse than the sparrows. Grubs are destroying grass on land that has not been cultivated for some years, but not to the extent of last year. Stock are in good condition and no complaints of disease so far have been reported. The use of phosphatic manures seems to have checked infection.

GAWLER RIVER.—The weather has gradually warmed up, but is still very changeable. The late thunderstorm has done no harm, but rather freshened up summer crops which are now feeling the want of moisture. Weeds have started on fallow land which necessitated another working. Thatching haystacks and gathering straw for feed and shelter is the general work now. Feed is getting scarce although stock are still in fair condition, but the yield of milk is falling off fast, especially where cows are not hand-fed.

MOUNT REMARKABLE.—Practically no rain has fallen here since first week in December, though on several occasions there have been indications of thunderstorms. A heavy fall is badly wanted to replenish dams and tanks. Weather, close and threatening. Average wheat yield last harvest for this district is about 12bush. Total rainfall recorded here for 1900, 19·48in.

ORROROO.—The weather for the past three months has been very changeable, but on the whole, the summer has been rather cool. Very little rain has fallen in this district since the end of September last. Owing to the past bad seasons, &c., a great deal of cocky chaff has been put under cover, in case of want, and a great deal of straw has been gathered and put into stacks. Many farmers are getting ready for seeding. Dams and tanks are either dry or getting very low, and 3in. or 4in. of steady rain would be beneficial.

PENOLA.—Very little rain has fallen. Grass is very dry, though stock keep in good condition. Bush fires have been very prevalent. Soft fruit crops are all harvested. The plum crop was good, but prices very low. Apples are now being picked for export at Coonawarra, and the vintage is expected to begin soon. Vines are carrying a good crop, although the berries in some places are not so well filled out as last year.

PORT ELLIOT.—The weather has been seasonable, and a little less than an inch fell in January.

RED HILL.—Weather for February mostly hot with some very dusty and sultry days. Wheat crop cleaned up well. Some reaped 8bush. while others went up to 16bush. The sample in most cases is good. Working for fallow lands has commenced. Dry feed is still fairly good. A few cases of strangles among young horses have been reported.

RIVERTON.—Most of the wheat has been cleaned up and expectations have been more than realised. Stock, &c., in good condition. Month has been very dry.

SADDLEWORTH.—The weather has been warm and dry. Dry feed remains good, and stock in good condition. The harvest is the best for many years, due probably more to the favorable winter and spring rains than the use of manures, though these are being used very extensively, and are generally drilled in with the seed.

WATERVALE.—A good rain is badly needed for the vines and fruit trees; otherwise the season is all that could be desired.

WILSON.—A good rain fell towards the end of month, which will materially alter the prospects of the season. More rain is yet required to soak the subsoil.

YORKETOWN.—Harvesting is over without damage, and with good returns. Up to five bags per acre have been reaped on lands drilled in with super. Stock looking well.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of February, 1901 :—

Adelaide	0.03	Hoyleton	0.10	Macclesfield	0.07
Hawker	1.29	Balaklava	0.08	Meadows	0.01
Craddock	1.75	Port Wakefield	0.28	Strathalbyn	0.04
Wilson	1.40	Saddleworth	0.80	Callington	0.05
Gordon	0.82	Marrabel	0.06	Langhorne's Bridge..	0.05
Port Germein	0.17	Riverton	0.05	Milang	0.04
Port Pirie	0.71	Tarlee	0.03	Walleroo	0.25
Crystal Brook	0.54	Stockport	—	Kadina	0.59
Port Broughton	0.83	Hamley Bridge	0.03	Moonta	0.44
Bute	0.52	Kapunda	0.09	Green's Plains	0.61
Hammond	0.18	Freeling	0.02	Maitland	0.23
Bruce	0.25	Stockwell	—	Ardrossan	0.28
Wilmington	0.51	Nuriotpa	0.02	Port Victoria	0.12
Melrose	0.52	Angaston	0.03	Curramulka	0.02
Booleroo Centre	0.27	Tanunda	—	Minlaton	0.07
Wirrabara	0.71	Lyndoch	—	Stansbury	0.06
Appila	0.23	Mallala	0.06	Warooka	0.08
Laura	0.59	Roseworthy	—	Yorketown	—
Caltowie	0.39	Gawler	—	Edithburgh	0.04
Jamestown	0.46	Smithfield	0.05	Fowler's Bay	2.99
Gladstone	0.60	Two Wells	0.20	Streaky Bay	4.67
Georgetown	0.44	Virginia	0.10	Port Elliot	3.05
Narridy	0.68	Salisbury	—	Port Lincoln	0.84
Redhill	1.04	Teatree Gully	0.15	Cowell	1.92
Koolunga	1.03	Magill	0.04	Queenscliffe	0.17
Carrieton	0.15	Mitcham	0.02	Port Elliot	0.14
Eurelia	0.29	Crafrers	0.18	Goolwa	0.10
Black Rock	0.10	Clarendon	0.29	Meningie	0.05
Orroroo	0.10	Morphett Vale	0.08	Kingston	0.09
Johnburgh	0.24	Noarlunga	0.01	Robe	0.21
Petersburg	0.38	Willunga	0.11	Beachport	0.42
Yongala	0.23	Aldinga	0.02	Bordertown	0.23
Terowie	0.57	Normanville	0.07	Wolseley	0.36
Yarcowie	0.26	Yankalilla	0.11	Frances	0.04
Hallett	0.27	Eudunda	0.06	Naracoorte	0.15
Mount Bryan	0.51	Truro	0.04	Lucindale	0.10
Burra	0.77	Mount Pleasant	0.11	Penola	0.12
Snowtown	0.77	Blumberg	0.12	Millicent	0.19
Brinkworth	0.62	Gumeracha	0.17	Mount Gambier	0.20
Blyth	0.42	Lobethal	0.15	Wellington	0.10
Clare	0.67	Woodside	0.31	Murray Bridge	0.15
Mintaro Central	0.14	Hahndorf	0.03	Mannum	0.07
Watervale	0.40	Nairne	0.20	Morgan	0.12
Auburn	0.15	Mount Barker	0.12	Overland Corner	0.14
Manoora	0.10	Echuunga	0.08	Renmark	0.58

BEEES IN THE ORCHARD.—According to a Californian paper the keeping of a dozen stands of bees in each twenty acres of olive orchard during the blossoming period has been found one of the most practical remedies for failure of trees to set fruit.

AGRICULTURAL BUREAU CONFERENCES.

NORTHERN BRANCHES.

The ninth Annual Conference of the Middle Northern Branches was holden at Gladstone on Wednesday, February 13.

Branches Represented.

Gladstone: Messrs. W. A. Wornum (chair), J. Brailey, E. Coe, J. Rundle, J. Shepherd, J. Sargeant, J. Gallasch, C. A. Gallasch, J. Burton, J. King, D. Gordon, J. Milne, G. M. Growden, and C. Goode (Hon. Sec.). Crystal Brook: Messrs. J. C. Symons, W. Hamlyn, A. Hamlyn, J. W. Venning, and J. Davidson. Caltowie: Mr. A. Kerr. Appila-Yarrowie: Mr. P. Lawson. Redhill: Mr. R. J. Nicholls. Narridy: Messrs. T. Dunsford and J. Darley. Port Germein: Mr. E. G. Blesing. From Central Bureau: Mr. A. Molineux (Gen. Sec.).

Other Visitors.

Mr. Geo. Jeffrey (Wool Instructor), Mr. A. E. Roberts, M.P., and Hon. A. Catt, M.P., and others.

Exhibits.

By Mr. J. Brailey (Gladstone): Apples (eight varieties), pears, and grapes (eight). By Mr. W. A. Wornum: Apples (two), pears, grapes (five), tomatoes, nectarines, and almonds.

The Chairman's Address.

Mr. W. A. WORNUM opened proceedings in a short address, welcoming members and visitors, to the following effect:—I have much pleasure in extending a cordial welcome to members and visitors to our Ninth Annual Conference of Northern Branches. I regret very much the absence of Professor Lowrie from the Conference, but his time is fully taken up at the College. His efforts, however, have resulted in an enormous benefit to the country at large, as many farmers have now adopted the methods advocated by him. I am sorry that more interest is not taken in the proceedings to-day, as out of twenty-four Branches communicated with only a small proportion of that number are represented. I am pleased to see the increased interest that is being taken by farmers in the important work being carried out by the Agricultural Bureau. Many of our most advanced agriculturists are members of various Branches, and they have collected much useful information by carrying out a number of valuable experiments. In this part of the North we have fortunately been blessed with a much better season than several previous to this. I am sure we all regret that the yield in the Upper North has again proved so precarious, as in many places there has been little or no return for the labor expended on the land, but the solution of this question is outside the sphere of the Agricultural Bureau. The use of artificial manures has, where tried in the better districts, proved remunerative, and has led to much better results than have been obtained for many years, and there is no doubt that the judicious use of fertilisers, together with thorough cultivation, will go a long way towards securing a maximum return from the land. A distinct advance has also been made in the selection of seed; new and improved varieties have been introduced, and better classes of wheat for either hay or wheat are now obtainable. The outlook on the whole is favorable, and those blocking progress to-day will in the near future awake and be carried onward by sheer force of popular opinion.

Observations on Farming.

Mr. THOMAS DUNSFORD, of Narridy Branch, read the following paper:—

Farming has been considered as a vocation requiring little or no experience, in fact, a calling that anyone could fall back on after everything else failed; but, as one who has made this his adopted home for the past twenty years, after living in the old country where a certain rainfall favors intense cultivation, and where there is a good demand for all products of the soil, my experience as an observer may be advanced for criticism. Australia has a dry and very uncertain climate, and nature has to be closely studied if success is to be achieved. We are living in a country where the greatest portion of our productions has to be exported, and we must work on the most economic lines to compete with the producers of the world.

In this Middle North, in order to live and keep a family, the holding should be at least 1,400 acres, so that minor products shall take their right place in helping to obtain a living; and for that purpose I suggest that there should be a division into six paddocks of 150 acres each, sheep proof. Two of these paddocks should be fallowed every year, as soon as possible after the seeding is finished, but on no consideration should it be later than September 30, and as much sooner as is possible, whereby you help nature to retain the moisture of one winter's rain for the production of the next year's crop. Such land after having been properly ploughed 4½ in. deep should, if necessary, have a surface working of at least 2 in. deep by a paring plough or cultivator, recognising of course that sheep must be depastured on such land. The carrying capacity of the 900 acres warrant by triennial cropping—that is to say, 300 acres under crop, 300 acres under fallow, and 300 acres under grass—in our locality would be about 400 sheep all the year round. The 100 acres balance should be divided into two grass paddocks, as natural pasturage for horned cattle and young horses to be reared to keep up the strength of the two six-horse teams necessary to properly work the farm. In no case do I recommend that beef should be raised on this area, but a good milking strain of dairy cattle should be fostered, not extensively, but according to grazing qualities of such area care being always taken that a cow that cannot be fed should not be kept. Consequently, for at least four months of the year, such herd should be fed either with hay chaff or colonial chaff, and bran or pollard, say up to 3 bushels per week per cow, mixed with a good allowance of such chaff, say six cows during the year. Always see that you have some fresh ones coming in at least two periods of the year, thereby ensuring a uniform quantity and quality of cream to be sent to a local creamery for manufacturing into butter.

Sheep should be of the merino breed, and the constitution of such should be the most vital point, always breeding from good big-frame ewes, not less than two years old, and not after they become broken-mouthed, as for the farm they are required to be scavengers, and probably sometimes are rather short of food when they have to clean a paddock of weeds on fallow. Therefore, the proportion I recommend is 100 breeding ewes, 100 hoggets, 100 two-year-olds, and the balance full-mouthed, either for butcher or some for home use. In the event of an increased area, I would advise that lambs should be raised for market.

Now, as regards the fertility of the soil. After a systematic cropping every third year—cleaning the land in every instance being the first study—you find that the production of the crop can be increased more by commercial fertilisers than by sheep-folding, and your experience of your land assures you that it requires and can take more manure without any fear of blighting in our fickle month of October. I recommend that a dressing of say 40 lbs. to 50 lbs. of good superphosphate be sown with the seed by a machine attached to the back of a dray, and to be worked as low down as possible to the ground, and to be buried at a uniform depth of 1½ in. to 2 in. by a skim plough. My reason for advocating the broad-cast system has two great things in its favor: first, its economical and simple mode of distribution; second, in no sense of the word is the drill a cultivator; and I ask any practical man what is to be done with the drill should we have a month's wet weather in the seed time, with a crop of wild oats to destroy, when you have only the ordinary strength of horse power to work the whole. The drill is practically then a burden. You must all remember that we have not of late years had those wet seasons which once were characteristic of our seed time; but they can and will come again, and I say advisedly that competition will at no distant date bring about a less costly and more desirable seed and manure distributor than the drill. Some will say the application of manure I recommend is insufficient for general use; but I consider the greatest boon the manure confers on the agriculturist is to keep a vigorous growth on the wheat in its infancy, say the first two months, when the soil is cold and wet, and its fertilising powers are not so great as the advancement of the infant wheat plant requires; but when 80 lbs. to 100 lbs. per acre is applied the growth of the plant is stimulated too much during the rainy period, and it suffers severely when the hot dry weather comes on. This shows that we can overdo a good thing.

The General Secretary referred to the advocacy of the use of the seed drill and of fertilisers by a number of authorities, including Mr. C. Rake, Enfield, Prof. Custance, Prof. Lowrie, and to the publicity given by the Correll

Brothers, of Minlaton Branch, to the results obtained by the Messrs. Cudmore, of the same locality, and repeated by themselves, from the drilling in of 60lbs. to 70lbs. of superphosphate with the seed wheat. These results being published in the *Journal* of the Agricultural Bureau led to a widespread adoption of the system that had long before been advocated in vain by the aforesaid persons, and the value of phosphatic fertilisers used last season amounted to about £130,000, whilst eight years before there was less than £5,000 worth used. With regard to the extra labor caused during a wet season through the use of the fertiliser and seed drill combined, he recommended them to carefully read what Mr. R. Marshall, of Templers, said at the late Congress of the Bureau in September last. He drilled in his fertilisers during March or April, and put his seed in in May.

Mr. Hamlyn (Crystal Brook) believed that to sow 300 acres the drill could be worked sowing both manure and seed in the wettest seasons. Mr. C. Goode (Gladstone) pointed out that probably the weeds would get ahead of the wheat plant if the manure was sown prior to seed. Mr. E. Coe (Gladstone) thought it would be too much trouble to drill both wheat and the manure separately, and said if the manure had to be sown first that he should broadcast the seed. Mr. D. Kerr (Caltowie) thought irregular crops would result from sowing seed and manure separately. Mr. J. Darley (Narridy) said that at Narridy 20 acres had been manured previous to sowing the seed, and though the crop was not as forward during the winter as crops sown with the manure, it came on better later on, and was equally as good. The crop was as free from weeds, &c., as others. Mr. J. Sargeant asked whether the manure would not lose its effect if a heavy rain came before the seed was put in. [Mr. Molineux : No.]

Can Farm Life be Made more Attractive?

Mr. J. C. SYMONS (Crystal Brook) read the following paper:—

By farm life I mean life on the land, whether as pastoralist, agriculturist, or gardener. I regard this as one of the most important questions of the day, because the prosperity, happiness, and the very existence of any country depends upon it. I presume we all want our country to be prosperous and happy, and to continue as long as the sun endures. If so, we must see that the people are well distributed on the land.

What has called into existence the Agricultural Bureau? What has made it necessary to hold these congresses and conferences other than a strong desire on the part of the more intelligent and more enlightened portion of the population of this State to help those who are on the land, and to make farm life more attractive?

It may be worth while here to state that I have had twenty years' practical experience of farm life—ten years on my father's land in the old country, and ten years on my own land in this State. I commenced to plough at 12 years of age. It was, of course, a single-furrow plough, and I had at first a boy to drive; but before I was 16 I had learnt to plough, mow, reap, and shear sheep.

It is a sad thought to me that as nations have become wealthy the people have been gradually shunted off the land. To quote from a paper on "The Progress of Boston":—

"Look at the past. When Egypt went down, 2 per cent. of her population owned all the land and wealth of the country; the people were starved to death!

"When Babylon went down, 2 per cent. of her population owned all the wealth; the people were starved.

"When Persia went down, 1 per cent. of her population owned the land!

"When Rome went down, 1,800 men owned all the known world.

"Out of the 40,000,000 people in Great Britain, 39,900,000 have no land.

"America is rapidly following in the steps of the old nations. Rings, syndicates, and millionaires own nearly 80 per cent. of the total wealth of America. In 1850 they owned 37½ per cent., so that within a measurable distance, say fifty years, unless those rings can be broken up, the whole of the United States will be in the hands of a few capitalists."

And are we not in Australia, though slowly yet surely, following the same steps? We undoubtedly are!

These are significant statistics and should make us all think, and, what is more important, act, and act on right lines.

Coming again to the importance of getting people on the land, I unhesitatingly state that history teaches this lesson clearly and most emphatically, that for a country to be prosperous its people must be distributed on the land.

When Rome was a rising power, from whence did she draw her soldiers who conquered the world? From the sons of pastoralists, farmers, and gardeners in Italy. And what were the first signs of deterioration and decay in that mighty empire? When the wealth of the world flowed into Rome, and the produce of the world was sent to Rome, they neglected agriculture, a few people bought up the land, and allowed it to go out of use. The people flocked at first and latterly were driven off the land into the cities, and decay and death rapidly followed.

Who, I ask, are the men that have covered Australia with renown, and have drawn forth such eulogies from Lord Roberts, the best man and the greatest general the world has ever seen? And who are the men Lord Kitchener is asking for to-day? Not men from the slums of cities who are useless and rotten, but men who have been brought up on stations and on farms in Australia, men who can go anywhere and do almost anything. And as long—and no longer, mind you—as the people are living on the land we shall always have a supply of this stamp of man.

How can this kind of life be made attractive? It is not attractive now, we must admit this. We deplore it very much.

If I were reading this paper before a political meeting I should refer to the necessity for cheap land, roads, railways, reliable rainfall, &c. But as we are supposed to eschew politics, I must go on other lines. First and foremost, we must educate and change public opinion. While people talk of the sons of the soil as "clodhoppers," "cockatoos," and "universal grumblers," is it any wonder that our youth do not take to it? While mothers and fathers prefer their boys to go into an office, and their daughters to be married to a clerk, can we wonder that farm life is not attractive?

This is all wrong. Here is the root of the evil, and it must be altered. Some time back the driver of my trolly was not about for a minute. Some goods had to be delivered at once. I got on the trolly along with the goods and, while driving up the street, met a man who looked up and said, "What, has it come to pass that you have to drive your own trolly?" I indignantly said, "Come to what?" We want to educate public opinion to think as highly of the horny-handed laborer as of the man who wears a black coat. There is a dignity about labor that we must learn to recognise.

Another thing to be done to make farm life attractive is to shorten the hours of labor. "Impossible!" say some at once; but wait a while. You will admit, I think, that this is one of the most serious charges against farm life. The common expression is, "You have to work from dawn to dark on a farm." How can this be altered? I have a plan. For eight months out of the twelve—say when the land is being fallowed and worked—a man can do a fair day's work and take quite enough out of his team of horses by working eight hours—from 8 to 12, and from 2 till 6. During those months we will assume that a single man is paid 20s. per week and board; but seeding comes, and we want him to work a day and a quarter each day; then give him 25s. per week. Harvest comes, and we want him to work a day and a half each day; then give him 30s. per week. If this were generally done it would do away, to a great extent, with the complaint of long hours of farm life.

Another matter that needs attention, if farm life is to be made attractive, is a different diet. Not necessarily more costly, perhaps in some cases not so costly. To illustrate: A farmer just before hay season kills a beast and salts it. All through hay harvest, every day and three times a day, salt meat with very little vegetables is placed on the table. Is it any wonder that men object to it? A diet with less animal food, considerably more vegetables, and a little fruit would be both healthful and more acceptable. Vegetables, with a little care, can be grown on almost any farm during the winter months.

Another thing that should be mentioned is "more comfortable and attractive homes." This, of course, must not be expected at once; men must be prepared to put up with inconveniences, and, if necessary, sleep for a time in a stripper. I have slept many a night in a stripper. But as soon as possible after a farmer is comfortably settled he should get comfortable homes for his men. Homes on the farm should be as attractive as homes in the township. Why not?

Now, what is the conclusion of the whole matter. First, we must be seriously impressed ourselves with the importance of keeping the people on the land; then impress upon our children the fact to get their living from the soil is the most noble and honorable way of obtaining a livelihood. Discourage a feeling of caste in every possible way. Don't think worse of a man because he has to mind sheep, guide a seed drill, steer a roaper, or dig potatoes; trying to remove any obstacles in the way of making life on the land attractive, always remembering that to work is honorable, to work is Godlike.

The General Secretary thought much more might be done in some of the directions indicated by the writer of the paper. That farmers might plant

more trees, and have fruit and vegetable gardens for their own use, &c. Mr. C. Goode thought that there was much in the paper to promote thought, but pointed out that the question could not be dealt with without entering the realms of politics; that the question of wages, &c., to men was regulated by the law of supply and demand, and that while there was a glutted labor market the tendency would be to take advantage of the necessities of the laborer.

The Use of Fertilisers.

Mr. DONALD GORDON, Gladstone, read the following paper:—

I confess that I have no special knowledge of the subject in hand, but having the privilege to be a member of the Gladstone Branch of the Bureau, where the subject is often discussed, and to be a constant reader of that valuable magazine the *Journal of Agriculture*, so ably and well edited by Mr. Molineux, surely counts for something. To have listened to Professor Lowrie on one of his master subjects, viz., fertilisers, and to have had conversations with intelligent and practical farmers who have experimented with artificial manures, surely in some degree qualifies and encourages a man with such slender capabilities as myself to give his honest convictions, based though they may be on knowledge gained from outside sources, on the important subject of the use of fertilisers.

It is not so very long ago since the subject began to be seriously discussed by the farmers in this colony. I well remember some ten or twelve years ago hearing Professor Lowrie, in the Alma Plains council hall, use words similar to these—"You mark my words, artificial manuring will become a general thing in South Australia," and I know the opinions of the majority of those present were opposite to those of the Professor. The farmers were really afraid that the expenses would more than absorb all the profits.

But what a change has come over the farmers, and not only the farmers, the graziers—in fact, all of us. Why we are now importing large quantities of fertilisers, we have several local manufacturers, and, through fear of running short, we have sent our Government Geologist (Mr. Brown) away into the interior in search of manure deposits; and we all hope he will be successful.

Fertilisers have come to stay, and thanks are due to Messrs. Correll Brothers, of Minlaton Branch, and to those who spoke and wrote and argued for the general use of fertilisers, because they knew these were the remedies for exhausted lands, rather than opening up new areas in our rainless North. I look for the day to come, not in the far distance, when fertilisers will be profitably used on our grassland. Our grass, on cultivated lands, lacks quality to an alarming extent, and this sooner or later, must be remedied.

But, coming to the use of fertilisers in the production of wheat or other cereals, this is a matter intensely interesting to our farming community. Can we produce cereals in payable quantities without the use of manures? In some parts of the colony I say, "No, we cannot." In other favored spots we may; but I contend that the judicious use of artificial manures will pay on any of our old lands where the moisture is sufficient. I would strongly advise all farmers in our northern country not only to go in for fallow, but to go in for *early* fallow; work it well so that it may retain as much moisture as possible.

The most suitable fertiliser? This may to some extent be a matter of opinion; but, from what I can gather, the greatest demand is for the superphosphates. It is so in my own district, and I have tried to gather information on this point from wider sources. Mr. M. Rankine, of Strathalbyn, in reply to a letter I sent him, says:—

"I have been using quite a number of manures, and English super. I have found the best so far, although I have been well satisfied with the superphosphates from the Adelaide Chemical Works. I used bonedust last year to make the English super. run more freely, and am of opinion that more bonedust and less English super. would be an advantage. These two fertilisers produced a heavy crop of Cape oats—46 bush. per acre. I found last season that the English super. forced the crop on much faster, and it stood out one-third thicker, than several other kinds of manure I tried, bonedust being one of them; but the later manures had overtaken the super. by the time the crop came in ear, only the crop was thinner." Mr. Rankine further says, "I have tried many kinds of manures, but have yet to find one that will give equal results with stable manure."

Mr. McLachlan, of Owen, had used superphosphate with good results, but strongly advocates bonedust if you can only procure it good and suitable for drilling. He sowed bonedust broadcast twenty years ago on a part of his farm, and you could see the good effect for eight years afterwards. I might multiply other practical men's opinions, but this would be taking up your time. The superphosphate seems to show good effect early, and thus gives a thicker crop, thereby saving seed; but I think it is a manure that exhausts itself quickly.

There are other manures which may be mentioned when this paper is under discussion, but I pass on to say a little on the quantity to use per acre in order to get the best results.

Mr. Jos. King, of Aylesbury Farm, Gulnare, after some experience, thinks about 50lbs. superphosphates is the correct thing, and one farmer told me he intended to sow 40lbs. super. per acre this year. Mr. Rankine has sown broadcast as much as 200lbs. to 300lbs. per acre of Chemical Works super., which lasted in the ground into the third year; and he finds in clay soils that from 70lbs. to 100lbs. is enough—more would endanger the crop to blight—but light sandy soils will take from 150lbs. to 210lbs. Now, from what I can gather, the differences of opinion are so great that I would advise all using fertilisers to make their own tests; some kinds of soil will take more than others. I think the general thing in this district is about 60lbs to 70lbs. super. per acre. From inquiry I find that that land drilled with from 50lbs. to 60lbs. of superphosphate last year has yielded 7bush. and 8bush. per acre more than land drilled or sown broadcast in the same paddock without any kind of fertiliser being used, thus showing the advantage of using manures.

The principal advantage of the superphosphate over some other kinds, it seems to me, is that it begins to be of advantage to the grain when it is germinating, and makes a much thicker crop, and consequently a heavier yield; but I think it exhausts itself, or nearly so, in one crop, and is no special advantage for forming a coat of grass after it has yielded a crop of wheat—that is with the present dressings of from 50lbs. to 70lbs. per acre.

Bonedust does not operate so quickly, and it requires more manure and more seed to be sown; but, if a free dressing is used, it most decidedly assists the grass, or remains in the ground to fertilise another crop of cereal. A mixture of super. and bonedust should do well.

One of the complaints against fertilisers is that they have caused an increase of "ball smut." Personally, I think the cause of the increase of smut is, in the first case, bad picking, the germs not being killed; and, second, the use of the drills breaking and distributing the germs.

But what is to be the result of the continued use of phosphates as manures? The editor of the *Agricultural Journal* has called our attention to this in his "Farm Notes" for the present month (February) in the following:—

"Owing to the much heavier crops being taken off the land through the use of phosphate fertilisers, there will be a necessity sooner or later to replace the potash and nitrogen removed with these heavier crops"; and he recommends that experiments should be tried by adding a little sulphate or muriate of potash and nitrate of soda. This is good advice, and should be followed. Nitrate of soda has the reputation of being a useful fertiliser for grass, and no doubt with superphosphates would be helpful to other crops.

I rather incline towards a moderate use of fertilisers than to heavy dressings, fearing that our too often dry springs, followed by hot winds, might prove disastrous to heavier crops.

Several farmers still seemed to cling to the idea that the use of fertilisers had aggravated the ravages of smut; but it was explained that this was owing to the smut balls being ground up while passing through the drill, and the wheat becoming again affected by the spores. Mr. Hamlyn asked how one side of an ear could be bunted, whilst the other side bore sound wheat? The General Secretary explained that the bunt plant was a distinct parasite, and might occasionally affect only one side of the stem and ear. Mr. Blesing asked what would be the best fertiliser to use on heavy black soil with limestone subsoil. The General Secretary thought probably superphosphate would give the best result, or a mixture of Bally bonedust with super.

The Most Profitable Sheep for the Locality.

Mr. GEO. JEFFREY, Wool Instructor, School of Mines and Industries, addressed the meeting to the following effect:—

They must remember that wool was not the only object to be aimed at, but that they must also consider the meat qualities of the sheep kept. He did not favor the keeping of crossbred sheep in this locality; they were a nuisance to keep, required more feed than the Merino, and the wool was not so profitable; and not only so, but the prices for crossbred wool fluctuate much more than do the prices for Merino wool; that while there is always a steady demand for Merino, the crossbred wool is not always fashionable. Nevertheless, notwithstanding his remarks in reference to the crossbred sheep, the breeder of fat lambs was justified in crossing; but he strongly advised only first crosses, and for this purpose nothing but Merino ewes should be kept and crossed with either Shropshire, Dorset Horn, or Southdown rams; the Shropshire and Dorset Horn being in his opinion the best, the lambs would mature very early, and the percentage was generally very high. Both for export and local consumption the Shropshire and Merino, or Dorset Horn and Merino crosses were much sought after.

Returning to the Merino type, Mr. Jeffrey said that many farmers at one time were not at all particular what kind of a sheep they kept so long as it was a sheep; he contended that it

cost no more to keep a good sheep than a bad one, while the former might return a fleece worth 3s. 6d., while the latter, one worth only 2s. 6d. The sheep to keep was the large-framed, robust animal, upon which a strong type of wool would generally be found.

Some contended that the smaller animal carrying a dense fleece would give a better result than the larger animal; but this was not logical reasoning, for more wool could be grown on the larger surface, and a longer staple. Mr. Jeffrey warned farmers against sacrificing the constitution of their sheep in order to get too great a quantity of wool; he said it was possible to give the animal too much wool to carry, and instanced a sheepfarmer who introduced the Vermont strain with a view to getting density and a greater quantity of wool. He got what he wanted, but found that his sheep could not carry the fleece; constitution and carcass had been sacrificed for wool, and he had to introduce other blood to counteract the degeneration. Some argued that the finer wool gave a greater return per lb. than the stronger wool; but from his experience for many years in the wool trade he could say emphatically that this was a fallacy. Buyers did not take into consideration the fineness or otherwise of the wool, so much as the loss that would result in scouring; and in 90 per cent. of cases this was the basis on which the buyer founded his conclusions as to value. In some cases where a very fine type of wool was concerned, a little more might be given for it; but in South Australia the distinction between fine and coarse wools as a rule was not sufficiently marked to make any difference in values, and therefore he advocated the strong constituted sheep with a good strong type of wool. Fine wool was too often associated with a delicate sheep.

Mr. Jeffrey then gave a few hints upon the treatment of wool at shearing time. Shearers should not be allowed to tear the fleece about, or chaff the wool up by second cuts; too much care could not be taken in packing, the fleece should be kept as compact as possible, and not stretched out to its fullest extent upon the table. For small clips he did not advise skirting heavily, though all dirty and seedy portions should be removed. If possible, each class of wool should be of not less than 4 bales, as lots under that number were all catalogued under one heading and did not receive the attention of the bigger buyers. The fleece should be rolled up so that the shoulder wool appeared on the outside. Heavy conditioned fleeces should be separated from the lighter wools, and tender and short wool from long and sound.

The broker ought to be taken into the fullest confidence, and be told exactly how the wool has been packed and classed; the broker should also be allowed to use his discretion as to value, as farmers often missed a good sale by asking too much, and wool once offered and withdrawn never showed to the same advantage, or received the same amount of attention from buyers when offered the second time. When he recommended strong wool he meant strong wool *with character*, a wool not plain and straight in the fibre, but having that wavy appearance, an elasticity about it.

Mr. P. Lawson (Appila) asked which wool, that of the Dorset Horn or Shropshire, was the most valuable. Mr. Jeffrey replied that the Shropshire had given the best results in the market. Mr. T. Dunsford (Narriidy) asked whether it would pay farmers to scour their wool. Mr. Jeffrey replied that he did not think it would, as it was almost impossible to sort the wool after scouring; the manufacturers preferred to scour the wool themselves, after sorting it. Mr. D. Kerr asked whether crossbred ewes being more prolific than the Merino, it would not pay better to keep them. Mr. Jeffrey said that the wool of the Merino ewe being so much more valuable, he considered that type the most profitable to keep, even if you did not get quite so many lambs.

How to Find an Outlet for our Surplus Produce.

Mr. W. J. VENNING read a lengthy paper upon this subject. The following is an abstract:—

The Bureau system of agricultural discussion has done a great deal to foster the best mode of tillage, with a view of raising large crops at a small cost, and with the least injury to the soil. South Australia is pre-eminently agricultural, and the high position we have gained is due to the energy, muscle, and brain of the farmer. The product of the soil is the basis of our wealth, and we are naturally desirous of introducing our produce into the best markets of the world, when by our thrift we raise more of the staple of life than we require. The governing powers should do everything to assist the producer to find the best paying market for surplus, and bring to the producer the best returns. The powers who frame our laws exert a great influence upon our productive enterprises. They can open or close ways to market by a system of tariff; the merchants and shippers by means of high freights close certain markets against us. For example, freights for produce from Port Adelaide to South African ports are £6 per ton. No doubt that high rate of freight is against us. Russia and, I think, Germany spent tens

of thousands of pounds in finding markets for surplus products. I think it was Russia for products and Germany for manufactures. Now, we of South Australia must in the most economic and practical way look for the best markets for our surplus products, and the Government should remove all the difficulties that now hinder our approach to the South African markets. The Government should use its influence with the War Office. They are drawing our best men away, they give us nothing in return. Lord Dunraven in one of his articles in the "Nineteenth Century" said the formation of our Imperial Customs union and reciprocal trading between the mother and her colonies is within the scope of practical politics, and is in the best interest of the empire, an empire that produces all that man requires. To my mind the growing importance of the colonies must be recognised by every Englishman, of whatever party. Why should we not exchange the various products of our colonies with the mother-country without the imposition of duties? The mother-country should study to draw her supplies to feed her men and horses from their own lands. The governing powers within the colonies should assist in bringing the products of our land before the notice of those who have to provision our coaling stations throughout the world. We should advertise our products, and draw attention of the mother-country to the fact that we have surplus produce to dispose of. To more fully advertise our products, should we not send parcels of them to where there is likely to be a market, and send a competent man to deal with them and make known the good qualities of our chaff and other products? The Imperial Government have taken tens of thousands of tons from the Argentine and America for Africa, not that it is better fodder than ours, but it comes cheaper. What is the freight from Argentine and America no one here knows; but you may depend upon it that it is not £6 per ton. The mutual support that England could give her colonies in matters commercial is important. We say our colonial efforts to foster enterprise only require such encouragement from the United Kingdom as would be given by a market preference over the shipments of absolute foreigners. America has benefited immensely by the African war, and if the colonies want to do business with the War Office in providing supplies to carry on a campaign like the war in Africa the local governments in the colonies must use their influence with the War Office, and with such men as Sir Alfred Milner, High Commissioner in Cape Colony, or with those who would be authorised to make purchases of the requirements to carry on such a campaign to purchase from the colonies. Our brave men have volunteered, and when it is so practically shown that we can produce such good men they might know that we have the very best produce for feeding man and horse, and every statesman of whatever party should see the force of buying from our colonies. There is a gentleman in the colonies from the Natal Government, and he states they will want produce for several years to come. This is an opportunity. Let us rise to the occasion, and let us one and all join together and advocate the best interest of our country.

A short discussion ensued.

Addresses by Members of Parliament.

The Hon. A. CATT, and Mr. E. A. ROBERTS, M.P.'s for the district, shortly addressed the meeting.

Free Parliament.

Re Supplementary Farm in Connection with Agricultural College.—The Hon. A. Catt, M.P., asked for an expression of opinion on the probability of establishing a dairy farm in a suitable locality. Mr. Molineux said that he considered the establishing of a supplementary farm was necessary, so that students might from actual practice be able to follow the processes which must be followed to secure the best results. Roseworthy was not well suited for this purpose, not yet for the production of root and fodder crops, vine or fruit culture. That there was not sufficient room for maintaining the numerous breeds of stock, poultry, &c., all of which should receive special attention, and the purchase of an estate in a more suitable locality, where other branches of farm industry could be taken up and treated in a fitting manner. Mr. Venning was opposed to the disposal of the Roseworthy farm, and moved to add to it 1,000 more acres of land. This was seconded by Mr. T. Dunsford. Mr. C. Goode moved an amendment that—"As a recommendation from the meeting the estate at Roseworthy be disposed of and that another and more suitable estate for all purposes be obtained." This was seconded by Mr. J. C. Symons. Mr. Molineux suggested that the matter be referred to the various Branches for discussion, and this idea was adopted.

A question was asked "What effect will the use of manure have upon the feed, and consequently upon the stock?" Several spoke of the very beneficial results that had been apparent in the increased carrying capacity of the land after the use of fertilisers.

"Does it pay to keep sheep off the fallow in order to keep the wool clean?" Mr. Jeffrey replied, saying that it should be an object with the farmer to help keep his land clean by keeping sheep, and that though the wool might get a little dirty it weighed all the heavier, and buyers of wool, as a rule, rather under-estimated the loss in scouring sandy wool, so that the farmer did not suffer in that respect as much as, perhaps, he was sometimes inclined to think.

The Conference was followed by an enjoyable social, given to the farmers by Messrs. James Martin & Co., of Gawler.

FAR NORTHERN BRANCHES.

The Fourth Conference of the Far Northern Branches of the Agricultural Bureau was held at Quorn on Friday, February 15.

Attendance Roll.

The following gentlemen represented their Branches:—Quorn: Messrs. R. Thompson (chair), C. Patten, G. Altmann, H. S. Stacey, H. Cowan, J. B. Rowe, James Cook, F. Herde, W. Toll, and A. F. Noll (Hon. Sec.). Arden Vale: M. Eckert, C. Pearce, E. H. Warren, and L. E. Warren. Wilmington: J. Schuppan and R. Cole. Woolundunga: N. Rogers, J. H. Michael, and T. H. Prosser. Richman's Creek: W. Freebairn (chair), A. Knauerhase, J. Knox, J. McSkimming, T. O'Donohue, J. Kelly, J. J. Gebert, M. Hender, and T. Mattner. Wilson: W. H. Neal. Orroroo: W. Robertson. Visitors: Hon. E. L. Batchelor (Minister of Agriculture and Education), Hon. R. W. Foster (Minister of Public Works), Mr. Thos. Burgoyne, M.P., Mr. George Jeffrey (Wool Instructor, School of Mines and Industries), Mr. George Quinn (Horticultural Instructor), R. L. Winkler (Stock Inspector), Mr. A. Molineux (General Secretary, Agricultural Bureau), and several others.

Exhibits.

The Quorn Town Hall platform was decorated with a long loop of grape vine, showing luxuriant growth, and beneath it were staged ten sheaves of various wheats and parcels of separated grain, staged by Mr. A. F. Noll, Hon. Secretary of Quorn Branch. Two varieties of wheat by Mr. G. Altmann, Quorn Branch. Several varieties of grapes, tomatoes, and nectarines, by Mr. James Cook, Quorn Branch. Melons, cucumbers, beans, tomatoes, and various flowers, by Mr. Benda, a resident of Quorn. One of the samples of wheat shown by Mr. Altmann consisted of several heads from a crop grown at Pichi Richi in 1879, which yielded over 30 bush. per acre. The variety was like Old Purple Straw, and of very large size.

Chairman's Opening.

Mr. R. THOMPSON, of Quorn Branch, took the chair, and said he was very sorry there was a small attendance of Branch members. They had not such a good show of fruit and grapes as last year. Only one garden survived the

onslaught of the grasshoppers. The harvest was nothing to what they had last year. He hoped, however, there was a turn in the tide, and that the following seasons would be far more prosperous than they have been for several years past.

Address by Minister of Agriculture.

The Hon. E. L. BATCHELOR (Minister of Agriculture and Education) was to have spoken next, but, owing to a limited attendance in the morning, spoke to the following effect in the afternoon :—

He expressed the deep sympathy that every one felt with the farmers in the North that the harvest had again been a failure. It was most depressing and heartbreaking work to put in crops only to reap seed, and in some cases not even that. This year through the rest of the colony they had a most bountiful harvest. It was one of the finest on record. When they remembered the large tract of country from which very little would be reaped, and that the average would be 8 bush., they could see what an exceedingly good harvest it had been except in this part of the colony. The work of the Agricultural Bureau had been largely instrumental in bringing about the results obtained. The work of Professor Lowrie and his predecessors, and the various Branches of the Bureau in showing what was the best thing to be done in the various localities in the way of fertilisers had had a great deal to do with the result obtained. The work of the Bureau would be rather more important under the altered conditions which would obtain under federation. In a couple of years the inter-State duties would be removed, and while that would not affect the raising of wheat and wool, almost all the other products of the farm and garden would be affected. They would have a much larger market than they had hitherto, and they would have more and keener competition in the by-products, for instance, in dairying and stock-raising. Before long the stock tax would be removed; there would be a free interchange of stock all over Australia. One result of that would be that they would have to be more careful than they had been hitherto, and they would have to try to keep diseases, when they had found a footing in one State, from getting a footing in the neighboring States. The same remarks applied to fruit. South Australia, on the whole, was more free from insect pests and fruit diseases than the other States. Some of the other States had natural advantages which South Australia had not in the way of raising some classes of stock. So only those producers who adopted the best, latest, and cheapest methods would be able to hold their own. They would want to do a lot of work during the next ten years in many directions in order to be thoroughly equipped for the removal of barrier duties, and retain for South Australia the best possible advantages. Nothing was a greater necessity than a wider spread of agricultural education. It was not enough that forty boys should go annually through the Agricultural College, of whom 25 per cent. engaged in the business after leaving the college. There ought to be opportunities for young people to get the latest and most scientific education and technical knowledge as to how to conduct their business. The old methods, which were all right when they had a barbed-wire fence all round them, would not do when their neighbors had new and better methods. He hoped every member would recognise the economy of spending money in agricultural, horticultural, and viticultural education. The Bureau was one of the best means for disseminating education. Nothing new was wanted in the way of Government institutions. All that was wanted was that they should use to the fullest possible extent the organisations they had at present. The industries of the colony were on a fairly firm footing just now. The export trade was fairly satisfactory. Except in the staple products it was, of course, very young, but it was growing rapidly. He meant the lamb trade and butter industry. The export of butter had not extended during the past year anything like as much as he expected. They had an immense quantity of feed, but he supposed the reason was that they had not been able to breed up stock sufficiently. The lamb trade was in a satisfactory condition. The Government freezing works dealt with 101,000 lambs and sheep, as against 91,000 last year. In addition, the Storage and Ice Company turned out about 30,000 lambs; that meant 130,000 carcasses against 91,000 last, 45,000 the year before, and 18,000 the year before that. Had the contracts for the new freezing plant been ready at the date fixed, so that there would have been no block, the Government would have done the whole of that work, and perhaps some additional. He did not regard the fact of their having another establishment in Adelaide dealing exactly with the same class of business with any regret at all. It was just as well that they should have the spur of competition of private enterprise. It would keep their expenses down to a proper thing, and prevent carelessness in methods. Let them have a Government institution where it could be clearly shown that it would be of advantage to the community. Unless that could be shown they did not want to meddle in private enterprise could do the work. The Bureau was doing exceedingly good work, and it was the intention of the Government to foster the work of the Bureau in every possible way. On behalf of the Government he expressed the hope that the long lane of failures would have a turning this year; and that at the next Conference they might be able to boast that the North had again produced a very large proportion of the wheat of South Australia. (Cheers.)

Other Addresses.

The COMMISSIONER OF PUBLIC WORKS (Hon. R. W. Foster) did not know any institution in South Australia of greater value, and that was doing a better work for so little money, than the Agricultural Bureau. There was no department certainly in the State that was more helpful to the Government than the one represented there that day. He was impressed by the remarks of the Minister of Education as to the increasingly good work that might be expected from the Bureau on their entry as a State into the Commonwealth. They were essentially a producing and not a manufacturing community in South Australia, and in order to keep the colony going they would have to depend very largely on the producers of South Australia. It was very fortunate that the work of the Bureau in the past had laid such exceedingly good foundations. The wealth of the producing forces of the colony had been increased very largely by the influence of the Bureau throughout the colony than by any other means. When Professor Lowrie, a few years ago, was seeking to stimulate production, and was impressing on the producers the necessity of applying science to agriculture, he had a great deal of prejudice to overcome. Through him, greatly assisted by the Branches of the Bureau, that prejudice was almost entirely broken down. He was very much impressed when visiting Roseworthy recently to notice the results that were being obtained by the farmers surrounding the college. They had a better opportunity of seeing the work that was being conducted at the college, and in every case where the men followed the professor they had splendid returns. In nearly every instance the old order had given way to the new, and it was a blessing to South Australia that it was so. As far as agriculture was concerned, they were renewing their youth. South Australia, as the professor said, could increase her acreage by one-third or one-half, and he thought in the fair rainfall districts she was going to increase her average by one-third under the new order of things. The work begun and the results already achieved pointed to better times for South Australia. For this they were indebted to the work of the Agricultural College and the Agricultural Bureau. All the experts engaged by the Government in disseminating the approved principles were doing splendid work. The Bureau deserved well of the Government, and he hoped the Minister would take the hint and give a better vote. (Cheers.)

Mr. T. BURGOYNE, M.P., said such Conferences were of great benefit and importance to the producers of the colony. Considering the bad seasons, the wonder to him was that the men had been able to live in the country at all. He thought, however, a turn in the tide was coming. He had watched the seasons in the North for the past fifty years. There had been a recurrence of dry seasons every eleven years—1854, 1865, 1876, 1887-88, 1898-99—and there had been the same periodical return of wet seasons in 1856-7, 1867-8, 1878-9, 1889-90. According to his calculations they should now have a return of good seasons. In the Agricultural Bureau they were employed on what was pre-eminently a co-operative work. He had always advocated the claims of the Agricultural Bureaus in his place in the House. He was encouraged to hope that the Government would do more in the future than they had done in the past for the Agricultural Bureaus.

[The three foregoing addresses are taken from *Register* report.—GEN. SEC.]

Rabbit Destruction.

Mr. MARK GRAY, of Wilmington Branch, sent the following paper:—

This subject is forcing itself on us in such a way that we can no longer ignore it; and unless we take united action the advent of good seasons will prove a curse instead of a blessing, by causing the rabbits to increase to such an extent that we shall be unable to cope with them. From all directions we hear accounts of their ravages, and the damage done by them cannot be estimated. Individual efforts are of little use, as I have found out by hard experience, for while I have been doing my best to destroy them my neighbors have done little or nothing, so that my time and expense has been practically wasted. The chief excuse of farmers is that they have no time; but time would be better employed destroying vermin than in growing crops for them to eat. I know that by united action we can keep them down, and now is the time to do it, for those we kill now will leave less to breed in the spring. There are various methods of destruction, but the only one of which I have had practical experience is phosphorised pollard, and this I believe to be the cheapest and best for our northern lands. It requires a little care in mixing and laying the baits. I suggest that one careful man in each district should be asked to mix all that is required for that part, thereby reducing the danger through carelessness or unskilfulness to a minimum. If properly laid in pills about $\frac{1}{4}$ in. in diameter there is no danger to horses or cattle. For a farm of 1,000 acres the cost should not exceed £1 per year in material, and a few rabbits soon do damage to that amount. Where there are burrows on the land or bush fences do not fill up the one or burn the other, as they are one of your best helps by gathering the rabbits together so that you can destroy them. Lay the baits in the evening, if possible, for they will take them better than if dried in the sun. The baits must not be laid where pigs or poultry can get them. Where rabbits are thick they can be made to pay part of the cost by sale of skins. The proportion that I use is 28lbs. pollard, 10lbs. sugar, and two

and a half sticks of phosphorus. I have been using it for three years, and have not lost a beast through it, although I have not taken any trouble to protect them from it. That stock have been lost through it I have no doubt, but it has been through carelessness or stupidity. One man washed out the bucket he had mixed the stuff in and gave it to the pigs—result, dead pigs. Another laid it about in heaps and lost some cows; but that is not the fault of the poison. As regards fires, that danger has been done away with by dissolving the phosphorus in bi-sulphide of carbon before mixing. I am glad to see that the councils are getting alive to the danger, but surely it would be better for us to go at it willingly than be driven through fear of the law. There will be some who through carelessness or laziness will have to be compelled, but such men should not be tolerated but informed on at once. None of us like to play the part of informer, but a man who keeps vermin to eat you out is no better than one who picks your pocket. In conclusion, I would urge on all to take vigorous action at once and give no quarter to young or old rabbits.

Mr. Schuppan mentioned that Mr. Slee and Mr. Gray, neighbors of his, always carried and distributed phosphorised baits when they went out mustering. Mr. J. Cook had tried cyanide dissolved in water. Much of the water was taken by the rabbits at night, but he found no dead rabbits, although there appeared to be a diminution. Doubting the efficacy of the poison, he caught some rabbits and gave each a small dose of the water, and in every case the rodents died within a few minutes. When he used phosphorised pollard he found great numbers lying dead. Mr. G. Altmann advised giving the rabbits access to pure water for a time, and then poisoning it with strychnine. He had done this, and found sixty-one dead the first morning, and forty-seven, nineteen, and nine, on following mornings. Mr. Michael, of Woolundunga, had used much phosphorised pollard with excellent results. He would like the General Secretary to tell him how long the poisoned baits or poisoned rabbits would retain their toxic properties, as cases had been reported of live stock being poisoned through picking up the old baits or chewing the dried-up poisoned rabbits. The General Secretary said he believed the poison would remain active for a hundred years if the baits or rabbits were preserved dry for so long a time. Mr. R. L. Winkler (of Stock Inspector's Department) said several sheep had died through chewing poisoned rabbits. Mr. N. Rogers said carcasses of rabbits that had been poisoned over nine months have killed pigs and dogs. The worst part of the pest was that no man would confess to ownership of rabbits—all that were on his particular property belonged to his neighbors. It was extremely difficult to get the Act enforced. Its provisions were over-ridden by Justices. Even if a conviction were secured it was not uncommon to have a fine of £5 reduced to 5s., and the council prosecuting had to pay the costs of the action. Then the Government does nothing in the way of destroying rabbits on very large areas of Crown lands adjacent to farms, but try to enforce the Rabbit Destruction Act against the very men who are afflicted by the pests coming off those Crown lands. He doubted efficacy of phosphorised pollard. One of his pigs ate a tremendous dose of the phosphorised pollard, and lived several days after. Mr. Altman said that might be due to the phosphorus not being dissolved, in which case the lumps might have remained untouched by the pig. Mr. Burgoyne said that, if the laws were defective in any way, the farmers should at once get their representatives in Parliament to move in the matter, and have the defects remedied. The General Secretary suggested that the whole of the farmers in rabbit-infested districts should subscribe and take advantage of the Vermin-proof Fencing Act, and put up a wire-net fence between those large holdings and the farm areas. Possibly, in such a case, the Government would subsidise the amount so raised to protect themselves against the "Government" rabbits. The Hon. Minister of Agriculture said this might involve a very considerable expenditure, and might have to be carefully considered. The Chairman said Mr. A. Noll and himself were Justices of the Peace, and strictly enforced the Act; but it was not always pleasant to Justices to have friends and customers brought before them. He thought the Stipendiary Magistrates should try all such cases.

Drilling with Fertilisers.

The following papers were read by Messrs. J. McColl, A. F. Noll, and C. Patten, respectively:—

[By J. McCOLL.]

Having had but one year's experience with the drill and fertilisers, I do not claim to know a great deal about the system; but I purpose giving the result of the past season's operations on our farm.

The manure used was English superphosphates, and it was only put on well-worked fallow, drilled in with the seed at the rate of 75lbs. per acre. We commenced drilling in the first paddock on the 2nd of April, some three days after a fall of 2in. of rain, which left the soil in good condition for the seed. The paddock was finished on the 20th of the month. Between the 1st and the 20th 61 points of rain were recorded, but distributed over eight days. All the wheat came up well shortly after it was sown. The following are the varieties of wheat grown in this paddock, and the yield from each:—Red Straw, 18bush.; Dart's Imperial, 22bush.; Allora, 18bush.; and Petatz Surprise, 11½bush. Baker's Early and Bartlett's Cross were also grown, but as they were cut with the binder, and not being thrashed yet, I am unable to give the yield. In the next paddock we used the drill between the 26th of April and the 1st of May, sowing Baker's Early and King's Solid Straw, the yield being—Baker's, 17bush.; and King's, 16bush. Fourteen acres of King's adjoining the other were drilled in without manure, and the return from that was 13bush. When this paddock was sown there was not sufficient moisture in the soil to start all the seed, and it was about the 18th of May before there was sufficient rain to bring it all up; and from the 26th of April, the date on which we started with the drill in this paddock, until the wheat was reaped the rain recorded was 7·26in.

The amount of seed sown per acre, with the exception of Baker's Early and King's, was about 36lbs., and of those two about 40lbs.

The most prolific variety was Dart's Imperial. Three bags of this wheat were drilled in on 2¼ acres, from which about 3 tons of hay were cut and 107 bags of wheat reaped.

With regard to the soil. That in the first-mentioned paddock is principally grey slaty rises, with brown loam and sandy flats. In the other paddock the soil is more of a red loam and clayey nature.

The following is the rainfall as recorded on the farm for last year:—January, 0·19; February, 0·16; March, 2·59; April, 0·95; May, 1·09; June, 2·35; July, 1·32; August, 1·45; September, 0·68; October, 0·29; November, 0·14; December, 0·51. Total, 11·76in.

Now the all-important question to us on this subject is: Will it pay in our dry northern districts to use these fertilisers? My own impression is that it will in some of the more favored localities, such as along the slopes of the Flinders Range; but whether it is going to succeed on our dry open plains is a doubtful question that practical experience alone can prove. If we are going to use the drill and fertilisers, there is one point we must not lose sight of, and that is, if we are to get the best results the land must be well worked, and fallow in preference. The drill is not going to lessen labor in cultivation; at the same time, I believe that land well prepared will give the most profitable returns.

The Seed Drill and Artificial Manures.

[By A. F. NOLL.]

This is a very important subject. We all know that the soil is getting exhausted by continual cropping, therefore it is our duty to ascertain through experiment whether it will pay to use artificial manures here in the North, where our rainfall is so deficient that the failures are really due to the want of moisture rather than the want of manure in the soil. We should experiment on a small scale to find out which manure is best adapted to a certain soil. I have found last year that superphosphate, though causing a great and marked improvement on poor red sandy soil, did not show any perceptible difference on loamy dark clay soil, therefore, had I drilled in the super. on that kind of soil I would not have benefited to any extent. I drilled last year about twenty-five acres with about 42lbs. seed and 80lbs. super. One piece of Purple Straw (five acres) yielded 20bush. per acre; six acres Sullivan's Early Prolific about 12bush., it blighted off very badly and was oaty and thin; Allora went about 12bush. Alongside of these wheats I drilled in wheat without manure, which showed a very marked difference, as there was only about half, in some places about one-third, of the growth present, and that was nearly all wild oats. I am satisfied that on the poor red sandy soil it will pay handsomely to manure, but the land should be fallowed and clean. If the season is anything like favorable in the beginning the crop will grow so luxuriantly and will be so forward that should dry weather set in in September and October there will be a crop of hay if not wheat.

Wheats in the Straw and Grain.

Purple Straw, drilled, 42lbs. seed 80lbs. super.	20bush.
Sullivan's Early Prolific, drilled, 40lbs. seed 80lbs. super.	12bush.
Allora, drilled, 42lbs. seed 80lbs. super.	12bush.

Experimental Plots—Seed from Central Agricultural Bureau.

	Result.
No. 1 Rangit, 5ozs. seed	10lbs. or 32ozs. per 1oz. of seed
No. 2 Marshall's Hybrid, 5ozs. seed	15lbs. or 48ozs. "
No. 3 Silver King, 7ozs. seed	8lbs. or 18ozs. "
No. 4 Majestic, 5ozs. seed	5lbs or 5ozs. "

(Seed not from Bureau.)

No. 5 Steinwedel, 12ozs. seed	25lbs. or 33ozs. per 1oz. of seed.
-------------------------------------	------------------------------------

[By C. PATTEN.]

Being somewhat sceptical with regard to the advantages derivable from the use of drills and commercial fertilisers, of which so much had been said, I determined to test the question on a piece of very inferior fallow, on which no wheat had been raised during fourteen or fifteen years. I used 60lbs. English super. per acre with 52lbs. Purple Straw wheat on about two acres. On one side of that plot I sowed by hand next day, April 12, one and a half acres of same wheat, and nine and a half acres on the other, using 50lbs. seed per acre. After cutting the roads round the different lots I measured and weighed the results as follow: - Drilled with the manure, 6bush. 56lbs.; drilled without manure, 6bush. 24lbs.; hand sown without manure, nine and a half acres, 3bush. 13lbs.; hand sown without manure, one and a half acres, 2bush. 51lbs. The sample from manured plot was the most pinched. The ground was very patchy, consisting of red rubble clay and whitish limestone rubble. The manured crop was fully 4in. higher than the others during the middle of September, but by the end of October the others had become taller. I think the great difference between the yields from drilled and hand sown wheat was due to the seed having malted, owing to the light rain, and being too near the surface, whilst the drilled seed was sown more deeply and evenly, and kept on growing all through the dry season, though rather spindled. I have come to the conclusion that it will pay, even in dry parts, to use the drill. Less seed is required, and, as it is covered, the ants cannot gather it into heaps as they do with the broadcasted seed in some localities in the North.

In answer to Mr. E. Warner, Mr. C. Patten said his land had been long out of cultivation, and the latest crop, previous to manuring, had been a total failure. Mr. J. McColl said he had got 16bush. per acre from manured land, and 13bush. from that on which no manure had been applied. The grain was best on the manured land. Mr A. F. Noll said the crop on the manured land dried more than the other. Mr. Schuppan had tried varying quantities of super., from 56lbs. to 75lbs. per acre, and found that the smaller quantity gave the best results. He reckoned that he got an advantage of 7bush. per acre through the use of superphosphate. Mr. M. Eckert put in 40lbs. wheat per acre with 30lbs. super. on poor, lumpy, ill-prepared land, and got 6bush. per acre, whilst similar land, unmanured, gave him 4bush. per acre. A neighbor sowed rich land without manure, and poor land with fertiliser, and got equal results from both.

AFTERNOON SESSION.

Best Sheep for Northern Farms.

Mr. G. JEFFREY, Wool Instructor for School of Mines and Industries, addressed the meeting on above subject:—

After referring to the different breeds of sheep in Australia, the lecturer said he was strongly of opinion that the Merino sheep was the most profitable breed to keep in the North. Cross-breeds were not as a rule suitable to the northern areas; besides, they gave a lot of trouble to the farmers because of the difficulty of keeping them in the paddocks. Again, the wool did not realise much money per sheep, and, in view of the great quantity of long-woolled sheep depastured in the Argentine Republic, he could hold out no hope of any appreciable rise for many a long day. Even for the raising of fat lambs for market he favored the keeping of Merino ewes crossed with Shropshire or Dorset Horn rams. Thus, besides getting a good percentage, the lambs would be shapely, and would also mature rapidly; in fact, in about three months they should weigh 36lbs. to 40lbs., but as soon as they were ready they should be sold, thus getting rid of all crossbreds. The ewes, however, should be of the big-frame, strong, robust type. After dealing at considerable length with the advantages of keeping this type, and

comparing it with the small fine-woolled sheep, he summed up the matter by saying—"Endeavor as far as possible to keep a big-framed, strong-constituted Merino sheep, growing a robust wool of lengthy staple, showing plenty of character, and without sacrificing either the length or strength of fibre, have it as dense as possible." Hints as to how to pack farmers' clips for market were also given, and the best method of preparing skins for market was dealt with. A number of questions were asked and answered.

Fruit-growing.

Mr. GEO. QUINN, Horticultural Instructor, spoke to the following effect:—

He believed experience had shown that, excepting in very favored spots, any attempt at fruit-growing on a commercial basis must in the districts around Quorn end in disappointment and loss. For domestic supplies it would doubtless be possible to grow grapes, figs, peaches, apricots, and, in specially sheltered spots, the lemon and orange would prove of value. Irrigation was a necessity, and he strongly urged the utilisation to the utmost of storm waters flowing from small creeks and roadside ditches. To irrigate with the best results the soil and subsoil must be thoroughly prepared prior to planting. Given a well-broken retentive subsoil, into which floodwaters may be conducted in winter, and proper cultivation applied throughout the year, success might be expected, even though the rainfall be limited. He placed more value upon this method in the production of deciduous fruits than in applying water during the heat of summer. Summer irrigation tended to ruin the physical character of most soils, unless the after treatment were carefully performed. "Hardpan" inevitably followed upon slovenly cultivation after summer irrigation, and should injurious salts be present in any quantity a second evil would be encountered. The water should be placed deeply into the soil, and as soon as the surface dried sufficiently to permit cultivation the furrows or ring-basins should be broken up prior to the dry soil being replaced into them. He advised procuring the trees from the nursery as soon as the leaves began to fall, in early autumn. If planted while the soil yet contained warmth, the roots began to work immediately, and recovered from the damage incurred in transportation. The newly-planted trees—if deciduous—should be pruned at once, and for hot localities he strongly advocated low stemmed spreading trees, as they shaded the ground and avoided the rough winds considerably. To obtain short stems they should cut the tree off at knee height from the ground, and that fixed the height of the trunk for the tree's lifetime. The cultivation of the soil was of the utmost importance. Early in winter, as soon as the ground is workable, break it up roughly with fork or plough, and leave it so. All the rain that fell will soak in evenly then, or flood waters will penetrate deeply into the subsoil, which, if retentive, proved the cheapest reservoir. When spring arrived the surface should be pulverised down as finely as possible for a depth of three or more inches. This made a dust blanket-mulch which retarded evaporation. After each rain, shower, or artificial watering, stir it again, and if no rain fell an occasional stirring—not turning—would check capillary action and loss of moisture. The conservation of soil moisture was probably the most important item in fruit-tree culture in South Australia. Although fruit grown in small gardens costs perhaps as much as, or more, than would purchase it, it was fresher, and often more wholesome, and every farmer should, if possible, provide for his household in this important item of diet in a hot country.

In answer to questions, Mr. Quinn said he thought the lemon tree would do better than the orange in most parts of the North, which, however, was not usually suitable for any of the citrus family. He thought the hardiest varieties of table grapes for northern growers were Red Hamburg, Crystal, Muscatels, Wortley Hall, Doradilla, Trentham Hall, Grand Turk, Sweetwater, and Black Malaga.

Dairying.

Mr. J. A. LAUTERBACH, of Wilmington Butter Factory, forwarded a paper on "The Dairying Industry of South Australia," to the following effect:—

After twelve years' experience he could say that the dairying industry could be made to form one of the leading sources of income to a large section of South Australian landholders. The industry required no protection, but simply claimed honest and common sense patience and perseverance to make it at once progressive and abundantly remunerative. After dealing with the questions of the cow (the all-important factor to the production of good butter and cheese), cream, butter, washing, kind of churn, packing, and cheesemaking, he said it had often impressed him as being necessary to make our export trade in butter the success that it should be that, as we had so efficient and practical an expert at this end as Mr. Thomson, the Government should inspect all dairy produce on arrival in London before being submitted for sale. By this means they would be sure that only a first-class article was being offered.

Construction of Overground Tanks.

Mr. A. HANNEMANN, Arden Vale Branch, forwarded the following paper:—

I have collected lately some information about a new kind of overground cemented tanks for the storage of water, which I hear give general satisfaction, and which were first designed and built by Mr. B. Seppelt, of Seppeltsfield. They are round tanks, made of bricks and cement, and held together by iron bands. They are easily made and very durable. I believe that they would be especially valuable for storing well and spring water, and should take the place of the iron tanks, which are all right for rainwater, but will soon get leaky from brackish water. The following notes and directions for building these tanks have been kindly supplied to me by Mr. L. Alm, of Tanunda. He writes:—"I have spoken to several people who have built these tanks, either for themselves or for others. They all say they are more durable than any others, and also cheaper than underground tanks, and, although the first cost is a little more than for iron tanks, still in the long run will be by far the cheapest, as they need no repairs. The walls should be 4½ in. thick (the width of a brick), and the iron for the tires should be 2 in. x ½ in. The size of a tank to hold 5,000 galls. should be about 11 ft. wide and 10 ft. high. As the floor will be from 12 in. to 15 in. thick, the outside height would be about 11 ft. About 2,500 bricks and four casks of cement will be required, and six or seven iron bands. The bands at the bottom should be a little closer together than at the top. For the floor put in 6 in. of sand, then 6 in. of concrete, and then a layer of bricks. The bricks in the floor and walls should be well put together with cement, and well plastered with cement inside and outside. The tank should be a little narrower at the top than at the bottom, to prevent the bands from slipping downwards. One or more outlet-pipes should be put in about 15 in. or 18 in. from the ground.

The GENERAL SECRETARY said he had, in several places, seen catchment areas made in a very simple way. On any slight rise the surface soil was broken up finely to a depth of say 2 in., forming a triangle of perhaps 100 ft. at highest point and decreasing in width to say 15 ft. at the lowest end, with a length of 100 ft. At the lowest point the tank would be situated. The loosened surface was next coated with an inch depth of new lime, then the whole surface was harrowed well to mix the lime with the loose soil, next it was watered and then rolled. This treatment resulted in a nice smooth concrete surface, 944 square yards. Nearly every drop of water falling on this would run into the tank, and if fenced against trespass by stock the water would be bright and clean, and the surface would remain good for very many years. Of course much larger catchment areas could be treated in a similar manner. The Chairman said the cost for cement, bricks, and iron bands for a tank of the dimensions mentioned by Mr. Hannemann would be about £10, and a handy farmer could do the work within three weeks.

EVENING SESSION.

Summer Irrigation and Cultivation.

Mr. N. ROGERS, of Woolundunga Branch, read a paper on this subject to the following effect:—

In treating this subject we must assume that the garden has received proper winter treatment and the necessary irrigation and cultivation, for on this depends the whole of the summer and autumn fruitfulness. Assuming that this attention has been given, the summer treatment will begin with the bursting of the leaf and fruit-buds. The rainfall in the North from September till the end of January is usually very light. Not sufficient by any means to enable trees or vines to develop their fruit, therefore irrigation has to be employed. Sometimes this can be done from springs or running water-courses. A fruit garden in summer must have plenty of water, and unless that can be obtained no man, however skilled, can make a garden either a thing of beauty or of profit, and even then success depends upon its application. As soon as the leaves are well out and fruit shows signs of setting water should be applied. Every day that this work remains undone means loss to the owner; as the work of setting the fruit causes the tree to put forth all its energies it must draw its fresh supplies from the soil. If the ground has not been moistened by the rainfall it must be by irrigation or the tree will show

signs of exhaustion. I have seen more damage done to trees and a greater loss to the owner by the neglect to irrigate at this stage than at any other. If water is available and cheap, another watering should take place just as the fruit commences to swell. This will keep the tree continually growing. There is really no need to consider the fruit growth, as the health and vigour of the tree will indicate the state of the fruit. I have never seen useless fruit where the tree is healthy and of vigorous growth. The third watering is ordinarily the last; it should take place just as the fruit is beginning to swell out for ripening. The effect of this watering is surprising; it is just what is required to ensure rosy and luscious fruit. If you have to omit a watering from any cause let it be the second one; that may be done without serious loss, particularly if the season is not too dry and hot, but this last watering must be thorough.

The question often asked is—"How shall I convey the water, and what is the best way to irrigate?" This is done in various ways. I read of a large orchardist in California who watered his orchard by means of two tanks on wheels, with a tap and a piece of hose, giving each tree the water it required. This would mean the economising of water. The system adopted in my orchard is to plough a furrow just far enough from the tree as not to damage it. Run the water in this furrow until it reaches the far end, make a ring or basin round the trees, and fill it, and so continue to each tree or vine along the row. Should one then show signs of requiring more water than another, before getting too far take the water back to it again. That is usually sufficient. Care is required in this system, or the trees nearest the main will get more than necessary, while those at the far end do not get sufficient. The stream of water must be good, otherwise more water will be used than can be paid for without loss even at 6d. per 1,000galls.

Cultivation.

I have laid considerable stress on irrigation, but I must more strongly advise cultivation. A few days after each irrigation, the ground will be dry enough to work. I then plough back the furrow made for a watercourse, and thus break it up, preventing its becoming hard. Then with a digging-in prong or fork loosen the ground round the watered tree to a depth of about 2in.; also throw back any soil that has been taken out to form the ring or basin. Thus a splendid mulch is given, and the roots of the trees are kept cool, evaporation is stayed, and the ground remains damp for a considerable time. When this is done I cultivate the row where the furrow was made, and run the cultivator once on the other side of the tree and as close as possible to the tree. During the time that the trees and vines are growing the cultivator should be constantly at work. By this system evaporation is prevented. Hard uncultivated ground dries up and loses all the water, while a soft mellow surface retains it. Particularly must this be done during the growing season, as it destroys all weeds and keeps the ground clean, for all growth is at the expense of water. The weeds draw it up, as is seen if a large weed is cut off, the water shows itself in a damp ring round the remaining root. Weeds will evaporate it by their leaves much more quickly than either trees or vines. I have proved beyond a doubt that if we have a fairly wet winter better fruit can be grown by the frequent use of the cultivator without irrigation than with irrigation and a lack of cultivation. If one has to be neglected, let it be irrigation; but by no means stop the cultivator. Let it work after every shower of rain and when there is no rain at all.

A very short discussion followed, which elicited no fresh points.

Reference Libraries.

Mr. A. McDONALD, of Davenport Branch, contributed a paper advocating that each Branch of the Agricultural Bureau should possess a small reference library of agronomical information. Each library would probably cost no more than £10, or a total of £1,080 for the 108 Branches. Very much benefit would follow if this could be secured, especially if the books were exchanged or circulated amongst the Branches. This would tend also to a closer bond between the members, and be an inducement to many able men to seek admission to membership. If the whole sum of £1,080 were judiciously expended a really extensive and valuable reference library could be secured. Perhaps the money could be raised by subscriptions, entertainments, shows, or other means, to be devised by each Branch. Or could the amount be borrowed on security of the books, at 10 per cent. interest, with a redemption payment of 5 per cent. on the principal? This would entail a very small annual cost to each Branch, which would be decreased every year until principal and interest became obliterated. If this scheme should fail to be accomplished, perhaps a few wealthy and generous colonists might come forward with the necessary funds, or the Government even could provide the amount.

Mr. BURGOYNE, M.P., directed attention to several objections and difficulties which laid in the way, and showed that most or all the advantages sought could be secured for the benefit of all residents in each district through the medium of the public library or the board of governors, on which he occupied a seat.

Fowl Tick.

The GENERAL SECRETARY said, as many farmers had complained of the injury to fowls caused by fowl ticks (*Argas reflexus*), it would be well to say a few words on that subject. The ticks were very prolific, and would soon infect and fill every crack and cranny in the fowl-house or on the trees or wood heaps where the birds roosted at night. The great majority of the ticks lived in hiding in such places, coming out at night and feasting on the blood of the fowls, and then returning to their hiding places; but some of the ticks remained attached to the skin of the birds, chiefly on the bare places at the base of the wings and between the thighs and the body. The only cure was to remove the fowls to fresh quarters after applying kerosene, by means of a sponge or piece of flannel to the parts attacked by the ticks—repeating two or three times, if necessary, at intervals of a week, and to burn the old fowl house, or trees, or wood heap, for the ticks will live for an indefinite time even where the fowls have been removed. To prevent introduction of tick, all birds from other parts should be treated with kerosene, as before stated, and the fowl house should be built of iron with all the wood framing outside. The perches should be low, all on a level of say 18 ins. above the soil, hung by wires from above, so as to be removable. If ticks should gain an entrance to such a place, remove the perches, put in a good lot of straw, set fire to it, and look out that the wood-frame outside does not take fire. The heat will kill all the ticks and their eggs or young, without injury to the iron, and the perches can be washed with kerosene before being replaced.

A German visitor denied that the large ticks in the house were ticks. He insisted upon their being bugs; but would admit that the "insects" upon the fowls were true ticks. The General Secretary was compelled to give in to the reiterated statements—but could not be convinced.

Conclusion.

Particular votes of thanks were accorded to the Chairman and to Mr. A. F. Noll (the latter for his zeal in organising the Conference), and general thanks were given to all who had contributed in any way to this successful Conference.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, FEBRUARY 18, 1901.

Present—Messrs. F. E. H. W. Krichauff (Chairman), Hon. A. W. Sandford, M.L.C., Professor W. Lowrie, Messrs. W. C. Grasby, Thos. Hardy, M. Holtze, H. Kelly, T. B. Robson, C. J. Valentine, and A. Molineux (Secretary).

Diseases of Wheat.

Professor LOWRIE said he wished to refer to resolution passed at previous meeting, to the effect that the Secretary should send all samples of diseased cereals to him for examination. He would like to state that the examination of such specimens took up a lot of time, and required special knowledge and conveniences. He had never made any claim to be a vegetable pathologist, and there were no conveniences at the college for carrying out such work. In addition, he had far too much work to perform now. He could assure the members that he did not look on the action of the Secretary, in sending specimens of diseased cereals to Professor McAlpine, as any reflection on himself; he was only too glad to know that we had some competent authority to whom we could refer. Under the circumstances, he asked that the motion passed at previous meeting be reconsidered.

After considerable discussion, in which several members stated that they would not have supported the resolution at previous meeting but for the statement of other members that the Secretary's action was a reflection upon Professor Lowrie, Mr. GRASBY moved, and Mr. ROBSON seconded—"That, having heard the statement by Professor Lowrie, the motion passed at previous meeting, instructing the Secretary to forward all samples of cereals to Professor Lowrie, be rescinded." This was carried without opposition.

Conferences and Shows.

The SECRETARY reported that a Conference of Southern Branches would be held at Strathalbyn on March 22, and the South-Eastern Conference at Penola on April 24. The annual show of produce in connection with Cherry Gardens Branch was to be held on March 21.

Fruit Cars.

Consideration of letter from Cherry Gardens Branch, asking that the Central Bureau should urge on the Government the necessity for providing proper fruit cars on the railway was deferred until receipt of further information as to the intention of the resolution passed by the Cherry Gardens Branch.

Mr. HARDY said that in Victoria he noticed the growers were adopting special packages for soft fruits. The fruit was packed in single layers in small boxes, which were then packed in crates of different sizes, according to the fruit. This system prevented bruising, and secured good ventilation through the crates. The railway charged over double the ordinary rate for carriage of fruit in this way, the reason given being that the crates were carefully handled and always kept top side up. He found, however, that this was not always the case, the packages often being roughly handled. Personally, he thought they did not require special cars for fruit so much as sensible packages and careful handling on the railway.

Potato Scab.

Mr. KELLY said at a previous meeting reference was made to the potato disease spoiling our potatoes. He had recently noticed two references to cures for this disease. One was from the United States, where it was found that dusting the setts with flowers of sulphur before planting, and also applying sulphur at the rate of 200lbs. per acre, was effective in preventing the disease. The other was from Ireland, where a large grower had secured a splendid crop of potatoes where the plants were sprayed twice with Bordeaux mixture, while the unsprayed plants were withered into masses of bleached woody fibre, with considerably less than half the quantity of marketable tubers attached. Members pointed out that the reference at previous meeting was to the deterioration in quality of potatoes, and not to disease. South Australia was, fortunately, quite free from potato scab.

Extracts and Translations.

The CHAIRMAN tabled the following extracts and translations from Foreign Agronomical Papers :—

Manuring and Working Potatoes after Planting, by Dr. Tanoré. The newer sorts of potatoes raised in Germany being able to produce 200cwts. and more per half acre require, of course, also more nitrogen than farmyard dung can give, when 150cwts. of it give in the first year perhaps 30lbs. of nitrogen, and 10lbs. more may be found from former manurings. Even 120cwts. of potatoes would require (including the tops) 60lbs. of nitrogen, so that 200lbs. of nitrate of soda would still be necessary, containing 15 per cent. of nitrogen per cwt., of which two-thirds are available. Soil, even in very good heart, may still require 1cwt. of nitrate of soda. For early varieties to divide the doses of nitrate of soda is in no case advisable, and especially not where many weeks of dry weather may be expected. It is, however, different with potatoes that ripen late. In such case he advises to give, in heavy soil, at the planting, the whole of the nitrate of soda; on light soil one part, after the plants appear, together with a like quantity of sulphate of ammonia, which will act later on; but for these light soils nothing is better than green manuring to obtain fine crops. The nitrate should be harrowed in. Hoeing to destroy weeds and supply oxygen is, of course, necessary, irrespective of the necessity of preventing excessive evaporation where the soil, and especially heavier land, runs together after rain. Hilling up potatoes can in our climate be advisable where the soil is very wet; but, even then, it should be done only where the soil will become crumbling on top.

Planting of Large and Small Potatoes.—Professor Dr. Edler publishes results of planting, during four years, large and small potatoes, and finds that in similar soil the productivity is nearly alike if planted in well manured soil three feet apart. He used three sorts not known here, viz.:—

	Trigga.		Phæbus.		Viola.	
	Gramme Weight of Seed.	Gramme Weight of Produce.	Gramme Weight of Seed.	Gramme Weight of Produce.	Gramme Weight of Seed.	Gramme Weight of Produce.
Taken from strongest plants for four years	155	1,530	190	1,070	230	1,000
	145	1,270	190	1,335	200	1,480
	315	1,250	270	1,580	260	1,585
	135	1,440	195	1,640	190	1,125
Taken from smallest plants for four years	45	1,290	30	1,040	70	1,120
	40	1,420	25	1,015	65	1,130
	85	1,555	75	1,530	70	1,170
	55	1,440	25	1,250	45	1,300

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Paskeville, Mr. T. H. Price; Stansbury, Mr. F. Faulkner; Brinkworth, Mr. J. Cross; Redhill, Mr. A. McDonald; Koolunga, Mr. J. C. Noack; Boothby, Mr. W. Forbes; Lipson, Mr. A. B. Wishart; Maitland, Dr. Nichols and Mr. E. W. Moody; Mylor, Messrs. John Nicholl, W. J. Narroway, T. J. Mundy and W. H. Hughes; Minlaton, Mr. E. Correll; Naracoorte, Mr. H. Hassler; Belair, Mr. G. Rossini; Forster, Mr. J. H. Prosser; Watervale, Messrs. H. Ashton and E. E. Sobels.

Reports of Meetings.

The SECRETARY reported receipt, since previous meeting, of thirty-two reports of Branch meetings.

REPORTS BY BRANCHES.

Narridy, February 2.

Present—Messrs. A. McDonald (chair), R. Satchell, D. Creedon, J. Darley, E. Smart, J. Nicholson, J. Smart, J. Myall, H. McGar, and T. Dunsford (Hon. Sec.).

DAIRYING.—On recommendation of committee appointed at previous meeting, it was decided to purchase a Jersey bull. Mr. Satchell offered to look after the bull and to allow members to have use of the animal free, non-members to be charged 2s. 6d. for service. It was decided to accept Mr. Satchell's offer and to apply to Department of Agriculture for half cost of bull.

Narridy, January 26.

Present—Messrs. A. McDonald (chair), R. Satchell, J. Darley, D. Creedon, J. Smart, J. Nicholson, and Thos. Dunsford (Hon. Sec.).

DAIRYING.—Considerable discussion took place on question of purchase of pure-bred Jersey bull for service in the district, and a committee was appointed to inspect animals placed under offer.

WHEAT EXPERIMENTS.—Mr. Satchell tabled samples of wheat grown from Bureau seed: 4lbs. of Majestic wheat produced 48lbs. of grain; this is a late variety, and the weather conditions were unfavorable. Silver King yielded 43lbs. grain from 4lbs. sown; this also is a late variety, but appears well adapted to the district. Marshall's Hybrid produced 55lbs., and Ranjit 41lbs., in each case from 4lbs. seed; both varieties are early and suited to the district. The seed was in each case sown at rate of 32lbs. per acre, and the returns averaged 6bush. per acre.

MEMBERSHIP.—It was decided that all absent members be notified that the rule *re* non-attendance will be strictly enforced.

Koolunga, January 3.

Present—Messrs. J. Sandow (chair), J. Button, J. Jones, E. J. Shipway, J. Butterfield, G. Cooper, W. J. Jose, R. Lawry, and two visitors.

WHEAT EXPERIMENTS.—Mr. Button tabled samples of different wheats grown from seed received from Central Bureau, also two samples showing the benefit of pickling the seed with bluestone as a preventive of bunt. The seed wheat was first infected with bunt spores, then one portion was sown without pickling and the other after being pickled. The pickled seed produced a nearly clean crop, but that from the unpickled seed was affected to the extent of nearly 90 per cent. Mr. Button was of opinion that Dart's Imperial wheat, seed of which was received from the Bureau about three years ago, was a very suitable variety for this district. Off a piece of one acre sown with the produce of the second crop from the small packet originally received, 30bush. of good grain were obtained.

SHEEP FOR FARMERS.—Discussion took place on the wool and breed of sheep most profitable. Mr. Cooper favored the Merino; but difficulty was experienced in keeping the wool clean in the dry parts where they had to be driven to water. Mr. Button was also strongly in favor of the Merino, and was of opinion that the use of phosphates in their farming operations increased and improved the feed as well as the wool. Mr. Jose considered that the breeding and rearing of fat lambs for the market would prove more profitable than wool-growing for farmers. The Merino was favored by other members.

SEED WHEAT COLLECTION.—Rev. S. C. Mugford, a visitor, initiated a discussion on the proposal to collect seed wheat for those farmers whose crops had failed owing to the drought and ravages of locusts. A committee of six was appointed to collect seed wheat in this district.

Koolunga, January 31.

Present—Messrs. T. B. Butcher (chair), R. Palmer, J. Button, E. J. Shipway, J. Freeman, J. Pengilly, J. Butterfield, and one visitor.

BUNT AND FERTILISERS.—The Chairman wished to correct statement in the report of their December meeting. He was reported to have said that fertilisers were the cause of bunt. What he did say was that he believed the dampness of the superphosphate helped the bunt spores to grow, and gave them a better chance of growing into the wheat plant.

FERTILISERS FOR LIMESTONE SOILS.—In reply to question by members as to best fertiliser to apply to limestone soils, Professor Lowrie wrote that he had found superphosphate gave better results with cereals on such land than any other phosphatic fertiliser.

HON. SECRETARY.—Mr. J. C. Noack was appointed Hon. Secretary, *vice* Mr. G. Pennyfield, who has left the district.

Boothby, February 5.

Present—Messrs. J. T. Whyte (chair), R. M. B. Whyte, J. Bell, R. Chaplin, J. A. Foulds, H. S. Robinson, G. T. Way, and R. Carn (Hon. Sec.).

BUSINESS.—It was decided to recommend the local Show Society to offer prizes for steel forks for feeding winnowers and for filling chaff carts. Matters in connection with membership were also dealt with.

Nantawarra, January 31.

Present—Messrs. Jas. Nicholls (chair), J. W. Dall, A. L. Greenshields, A. Uppill, H. J. Spencer, G. Belling, and T. Dixon, jun. (Hon. Sec.).

STANDARD SAMPLE OF WHEAT.—The standard sample of the late harvest received from Chamber of Commerce was examined and considered to be a fair average for the season.

DISCUSSIONS.—Circular from General Secretary *re* discussions at Branch meetings was read. Mr. Dall thought more papers might well be contributed by the members, who could do justice to themselves and help their fellow members.

CATERPILLARS.—Mr. Dall asked if any members had noticed caterpillars attacking the wheat during the past season. He had seen some in his crops, and at reaping time had found several grains eaten out of a number of heads, though he could not say whether this was the work of the caterpillars or not. The Chairman said he found it not profitable to grow linseed, as the caterpillars took nearly all of the heads.

TOMATOES NOT FRUITING.—Mr. Spencer reported that his tomato plants flowered but failed to set any fruit. Mr. Uppill said this was not unusual; probably the fruit would set later on.

Holder, February 2.

Present—Messrs. F. A. Grant (chair), E. Crocker, J. Green, J. Rowe, E. Jaeschke, F. G. Rogers, John J. Odgers (Hon. Sec.), and two visitors.

REPORTS ON SEEDS.—Owing to dry season and absence of irrigation, melons of all kinds are late in maturing, and some of the plants have died. Very good onions have, however, been grown with nothing but the natural rainfall of 8in. for the year; brown Spanish and James' Long-Keeping being the sorts. Wood ashes were ploughed in three months before planting out. Where no ashes were applied the onions were very small.

Richman's Creek, February 5.

Present—Messrs. W. Freebairn (chair), A. Knauerhase, P. J. O'Donohue, F. Mattner, J. A. Knox, W. J. Wright, M. Hender, J. J. Gebert, J. McColl (Hon. Sec.), and one visitor.

CULTIVATION OF THE SOIL.—Discussion took place on paper on this subject, read by Mr. R. Marshall at the latest congress. Mr. Wright considered drills too costly for most farmers, though, of course, there was a considerable saving of seed by their use. If they could use manure so profitably as Mr. Marshall shows without resorting to the seed and fertiliser drill, it would result in a great saving in time and expense. The Chairman intended to test the matter for himself. He proposed drilling in some super early and afterwards broadcasting the seed, so as to save time at seedtime. Mr. Knauerhase used the drill last

year on land under crop the previous year, and got a return of 7bush. per acre as against 3½bush. without manure. The land was scarified before the drill was used. Not only did he get double the quantity per acre from the manured crop, but the grain was over the standard, while that from the unmanured land was only second grade. It was generally agreed that the seed and fertiliser drills were too costly, especially with wheat so low in price.

Gumeracha, February 4.

Present—Messrs. D. Hanna (chair), A. Moore, J. Monfries, J. C. Gall, W. V. Bond, A. E. Lee, H. Nosworthy, W. A. Lee, S. Gent, and one visitor.

OFFICERS.—Messrs. D. Hanna and T. W. Martin were re-elected Chairman and Hon. Secretary for ensuing year; Mr. J. Monfries was elected Vice-chairman. Arrangements were made for representation of the Branch at the Mannum and Strathalbyn Conferences.

Murray Bridge, February 6.

Present—Messrs. B. T. E. Jaensch (chair), R. Edwards, G. A. Kutzer, H. Schubert, F. W. Wundersitz, Hermann Schubert, W. Schubert, W. Lehmann (Hon. Sec.), and one visitor.

SHEEP FOR FARMERS.—The Hon. Secretary read a paper on "Keeping the Right Sort of Sheep," to the following effect:—

In the past it had been the practice of many farmers who have kept sheep to pay but little attention to the quality of the wool or the weight of clip. Though farmers pay more attention to these points now, there is still room for improvement in the selection of rams for the flock, in ewes for breeding, and in the treatment of lambs for the future wellbeing of the flock. To illustrate this point, the actual results of a few flocks in this district will be interesting. No. 1 flock consists of crossbreds, the cut averaged 6½lbs. and the wool fetched 4½d. to 5d. per lb. No. 2 is to all appearance pure Merino, cut 8½lbs. per sheep, and the wool fetched 5½d.; lambs averaged 3lbs. at 4½d. per pound. No. 3 consists of pure Merino from the well known Murray strains, and cut 9½lbs. of wool, which fetched 5½d. per pound; lambs, 4½lbs. wool at 4½d. It has been asserted that to obtain most profitable results crossbred sheep should be kept by the farmer. Now the deficiency in wool must be returned by the increased price for the carcass sold to the butcher, but he was convinced that, taken all round, actual results would prove that the crossbred sheep fails to do this, and that the wellbred Merino was far more profitable. In addition to this, crossbred sheep require more feed and water and better fences than the Merino. The question then for the farmer is, will it pay to procure a first-class strain of Merinos in place of the ordinary sheep now kept. With an ordinary ram of no particular pedigree, however good he may appear, there is no relying on the lambs he will get. They may be equal to him, or just as likely they will throw back to some inferior ancestor. In breeding from good stock of well known pedigree the farmer has every ground for expecting the lambs to show quality. A ram from a flock that has been carefully bred and selected for many generations should, if mated with deep-chested, large-framed ewes with dense fleece, leave behind him first class wool-producing sheep. Attention will, of course, be necessary, or the flock will soon deteriorate. The aim should be to always improve and never go back in quality. Care must be taken that the lambing is arranged for when there is sufficient green feed to keep them growing rapidly. A check when young is never really got over. It must be remembered that upon the lambs the future wellbeing of the flock is largely dependent. He found the best plan was to reserve a paddock and put the ewes and lambs in it when the latter are a few days old. It was also a good plan to put the ewes in the paddock a few weeks before lambing, but if the food is very good it is necessary to pay extra attention to them or they will get flyblown. Systematic and thorough culling of the flock, which requires a good knowledge of sheep and wool, at shearing time is necessary.

A short discussion ensued. Members admitted that it was wisest to start with the best class of Merino obtainable, but the cost of such sheep was beyond the means of the small farmer. The Hon. Secretary thought if one sheepowner in the district would purchase a few of the best pedigree sheep, not necessarily prizetakers, and dispose of the lamb rams at a moderate price to his neighbors it would be mutually profitable.

Mount Remarkable, February 7.

Present—Messrs. C. E. Jorgensen (chair), G. Yates, W. Lange, T. P. Yates, J. B. Murrell, J. McIntosh, H. N. Grant, and T. H. Casley (Hon. Sec.).

OFFICERS.—Hon. Secretary reported death of the Chairman (Mr. A. Mitchell), one of the founders of the Branch and an active worker. It was resolved to send letter of condolence to Mrs. Mitchell. Messrs. C. E. Jorgensen and W. Lange were elected Chairman and Vice-chairman for ensuing year, and Mr. T. H. Casley re-elected Hon. Secretary.

ANNUAL REPORT.—The Hon. Secretary's report showed that ten meetings had been held during the year, the average attendance being nine. Five papers had been read and discussed and much useful discussion had taken place. The wheats sent by Central Bureau had on the whole given good results and were likely to prove valuable for this locality.

WHEAT EXPERIMENTS.—The Hon. Secretary reported on experiments with wheats. The plots were 12yds. long by 4ft. wide, and all treated alike: 4ozs. Majestic returned 30½ozs; 4ozs. Silver King, 49½ozs.; 4ozs. Ranjit, 37ozs.; 4ozs. Dart's Imperial, 60½ozs.; 1½ozs. Petatz Surprise, 22ozs. In each case portion of the plot was drilled in about 2in. deep, and the portion so treated was in every instance much better than the rest of the plot.

Hawker, February 6.

Present—Messrs. S. Irvine (chair), R. Wardle, J. Moller, J. W. Fisher, A. C. Hirsch, and J. Smith (Hon. Sec.).

CURE FOR FOWL TICK.—Mr. Hirsch stated that about four weeks ago he found his fowls to be badly affected with tick, being almost featherless. He used tobacco water and found it very effectual, his fowls being in full plumage and laying well. He had tried other remedies, but nothing had been so effective as tobacco.

CARE OF HORSES.—The Chairman did not think in this district it was necessary to feed horses in sheds or stables. He had no shelter of this description for his horses, but they always seemed healthy and in as good condition as his neighbors' horses, which were provided with sheds. Mr. Hirsch thought, with two teams of horses with the same work and feed, those fed under cover would do better than those in the open.

FALLOWING.—The Chairman, in a discussion on fallowing, advocated well-turned furrows packed together, as he thought the weeds were destroyed and the land benefited. Mr. Wardle thought the land should be well pulverised, every care being taken to cut the furrow, but he did not think much good would result from packing the furrows. Mr. Fisher thought this would very largely depend upon the character of the land; he did not believe in too much working when the soil is dry.

Pine Forest, February 5.

Present—Messrs. J. Phillis (chair), E. Masters, W. H. Jettner, G. Inkster, and R. Barr, jun. (Hon. Sec.).

BEST WHEATS FOR DISTRICT.—Considerable discussion took place as to best three wheats for this district. Members were unanimous in placing Steinwedel first, but could not agree as to the next two. Red Straw, Phillis's Marvel (a new rust-resistant variety), Hawke's Clubhead, Dart's Imperial, and Purple Straw were favorably commented on by different members, but these have not proved altogether reliable in all kinds of seasons.

Redhill, January 31.

Present—Messrs. R. T. Nicholls (chair), A. A. Robertson, R. H. Siviour, H. Darwin, D. Steele, D. Lithgow, and J. N. Lithgow (Hon. Sec.).

EXPERIMENTS WITH WHEAT.—Members reported that the different wheats received from Central Bureau did well during the early part of the season, but with the advent of the hot dry weather their growth was seriously affected, and in some instances they failed to mature, while in others the grain was much pinched. Mr. Lithgow harvested 21lbs. Marshall's Hybrid from 1lb. sown, and 35lbs. Silver King from 1lb. sown. Members considered that all the varieties experimented with were more delicate than those usually grown in this locality.

Mundoora, February 5.

Present—Messrs. R. Harris (chair), W. J. Shearer, J. Blake, J. Loveridge, T. Watt, H. Haines, W. Mitchell, J. J. Vanstone, W. D. Tonkin, W. Aitchison, and A. E. Gardiner (Hon. Sec.).

THICK v. THIN SOWING.—Mr. Vanstone said that, from his own observations and from what he gathered from the many farmers he came in contact with, the crops this past season had been rather thin. He believed one reason for this was that at seeding time the rains were not sufficient to cause all the grain to come away; later on black rust also affected the crops. He was therefore of opinion that it would be better to sow a trifle more grain per acre than they had been doing. The Chairman and Mr. Aitchison agreed, but the Hon. Secretary was opposed to thicker seeding.

STOCK COMPLAINTS.—The Chairman reported loss of two cows, both of which were in fair condition. The complaint seemed very similar to impaction, both animals being affected during a sudden cool change after great heat. The Hon. Secretary said one of his neighbors had lost some cattle with the same complaint at the same time as Mr. Harris. Members considered that these sudden weather changes were very injurious to stock. Mr. Loveridge explained a simple method of slinging cattle when affected in this way. This was to excavate holes for the legs and roll the beast in so that the body carried its weight. By erecting a shade over the animal it would rest in comfort.

WHEAT EXPERIMENTS.—Mr. Loveridge tabled fine sample of Silver King wheat from a few grains received from Central Bureau. The plant was 3ft. high, and the heads well filled.

Hahndorf, February 9.

Present—Messrs. A. von Doussa (chair), T. H. Sonnemann, C. Born, P. Schubert, J. C. Rundle, and D. J. Byard (Hon. Sec.).

SPARROWS.—A discussion took place upon the value of sparrows as insect destroyers. It was mentioned that experiments in America showed that insects were found in sparrows during the breeding season, but not at other times.

CODLIN MOTH.—Members were unanimous that this pest is worse this season than in any previous year, although the regulations with regard to bandaging, etc., have been fairly well carried out. In one instance ninety-two larvæ of the moth had been found on one tree in a week. It was considered that more knowledge regarding the natural enemies of this pest would be useful. Mr. Sonnemann and others disapproved of the whitewashing of trees, as it was likely to injure their growth without effecting the work expected of it.

Mannum, February 8.

Present—Messrs. R. P. Scott (chair), J. W. Walker, F. W. Kowald, J. A. Schulze, W. Haby, R. Heidrich, E. Schuetze, A. Faehrmann, Hy. Brown (Hon. Sec.), and one visitor.

CONFERENCE.—Matters in connection with River Murray Branches Annual Conference, to be held on February 26 and 27, were dealt with.

STOCK COMPLAINT.—Losses of dairy cattle owing to impaction were reported. Feed is very dry and falling off considerably.

Lipson, February 2.

Present—Messrs. G. Provis (chair), W. F. Darling, Chas. Provis, Caleb Provis, H. Brougham, Geo. Carr, J. Brown, E. J. Barraud (Hon. Sec.), and four visitors.

POTATOES.—The Chairman tabled fine sample of Beauty of Hebron potatoes, the second crop in one year. The first lot were planted early in the winter, dug during first week of August, and seed set again the following week.

WHEAT EXPERIMENTS.—Mr. Chas. Provis tabled samples of wheat grown from seed received from Central Bureau. Majestic, sown late in June and reaped in December, yielded 5lbs. from 25 sq. yds. Ranjit returned 2lbs from 12½ sq. yds. Indian King was not worth growing.

WEED.—Specimen of weed growing in the district was tabled for identification.

Port Pirie, February 9.

Present—Messrs. P. J. Spain (chair), E. J. Hector, T. Gambrell, G. Hannan, T. Johns, H. B. Welch, W. K. Mallyon, J. Lawrie, and T. A. Wilson (Hon. Sec.).

OFFICERS.—Mr. P. J. Spain was re-elected Chairman, and Mr. T. A. Wilson elected Hon. Secretary, for ensuing year.

SEED WHEAT COLLECTION.—As the local district council has taken up the collection of seed wheat for farmers who have failed to reap any crop, it was decided that the members contribute through the council or direct to any farmer known to be in need of seed.

STOCK COMPLAINT.—Mr. Welch reported prevalence of disease in both horses and cattle, the latter suffering principally from impaction.

RABBITS.—Mr. Lawrie reported rapid increase of rabbits in the hill country, and thought all landholders should be compelled to take necessary steps to destroy them.

Gawler River, February 1.

Present—Messrs. A. M. Dawkins (chair), J. Badman, J. Hillier, R. Badcock, F. Roediger, J. Barrett, T. P. Parker, C. Leak, D. Humphries, W. Clark, and H. Roediger (Hon. Sec.).

STANDARD SAMPLE OF WHEAT.—Sample received from Chamber of Commerce was examined by members, who were of opinion that it was superior to that received last year.

SEED WHEAT FOR FARMERS.—It was decided to support movement for collection of seed wheat for farmers whose crops have failed through drought and ravages of locusts.

WHEAT EXPERIMENTS.—Mr. Parker reported that of the wheats received from Central Bureau last season, Marshall's Hybrid and Ranjit proved to be good early varieties; but Silver King and Majestic were too late for this district.

ONIONS.—The Hon. Secretary reported that the Weathersfield onion was not suitable to this locality, being too late and somewhat loose and coarse.

Davenport, January 24.

Present—Messrs. W. J. Trembath (chair), J. E. Lechy, A. McDonald, J. Holdsworth, W. Penna, and J. Roberts (Hon. Sec.).

MEMBERSHIP.—The rule with regard to non-attendance for three consecutive meetings to be enforced.

POINTS ABOUT POULTRY.—The Chairman read several extracts from Mr. Laurie's papers in *Journal of Agriculture*, with respect to utility breeds. The autumn and winter layers are most in request, as they lay when eggs are scarce, and by careful treatment they will lay almost as persistently as the smaller non-sitting breeds. Black and buff Orpingtons, barred, white, and buff Plymouth Rocks, and Wyandottes are classed by some breeders as amongst the best of winter layers. The paper recapitulated a deal of what has been advanced more than once by Mr. D. F. Laurie in this Journal.

Wilmington, February 4.

Present—Messrs. J. Hutchens (chair), F. Bauer, T. Carter, T. H. Harris, J. McLeod, J. Schuppan, J. Zimmermann, W. Slee, M. Gray, J. Lauterbach, A. Maslin, R. G. S. Payne (Hon. Sec.), and three visitors.

IRRIGATION AND CULTIVATION OF FRUIT TREES.—Mr. Rogers of Woolundunga Branch read a paper on this subject, dealing with the matter as it applied to the Northern Districts. He discussed the various methods of summer irrigation, and strongly emphasised the necessity for keeping the land well worked during the summer. After each watering it was essential that the surface of the soil should be well stirred to prevent evaporation and to keep the roots cool. Mr. Rogers showed samples of fruit from irrigated trees; the fruit was very large but not profitable to the grower; also fruit grown without irrigation but with intense cultivation, of good saleable character. Fruit from trees irrigated at the wrong time was small, and the trees themselves nearly leafless. He condemned the practice of summer pruning as injurious to the trees both at the moment and afterwards. The Hon. Secretary disagreed with Mr. Rogers' statement that the thinning out of useless growths in the summer would have an injurious effect. He did not approve of the use of the knife, but he was convinced from long practice that the pinching out of central growths during rapid woodmaking not only did not weaken the future fruitbuds, but assisted the development of wood and buds. He also quoted Mr. Geo. Quinn and others in support of this. In reply to question as to quantity of water required by a tree, Mr. Rogers said by the pit method 50galls. to 100galls., and by open drains 400galls. to 500galls. per tree during the summer was sufficient with proper cultivation. A lengthy discussion took place on the paper, and Mr. Rogers was thanked for same. He suggested that there should be an occasional interchange of visits and papers between the Wilmington and Woolundunga Branches.

Strathalbyn, February 10.

Present—Messrs. M. Rankine (chair), B. Smith, S. Sissons, R. Watt, H. H. Butler, W. M. Rankine, P. Cockburn, and J. Cheriton (Hon. Sec.).

CONFERENCE.—The Hon. Secretary reported having communicated with the different Branches, asking them to take part in the proceedings of the Annual Conference of Strathalbyn Branches to be held on March 22. It was decided to ask the Minister of Agriculture to open the proceedings.

PRESERVING COCKY CHAFF.—A long discussion took place on the best way to preserve cocky chaff, and a number of simple and inexpensive methods were brought forward. It was, however, the general opinion that sheds with galvanized iron would prove to be the best and cheapest in the long run.

BUSH FIRES.—Discussion took place on bush fires, and the best means of preventing same. It was decided to ask the local council to convene a public meeting to discuss the matter.

Baroota Whim, February 9.

Present—Messrs. F. H. Flugge (chair), J. McDougall, A. Spencer, T. Simper, and C. W. Hoskin (Hon. Sec.).

STOCK COMPLAINT.—Mr. Flugge reported loss of several horses from some strange complaint. The animal sits up with extended fore legs, moaning as if in pain. It keeps moving round on the fore legs, dying in from seven to ten hours. On a *post-mortem* examination being made, he found the bowels much inflamed, but there was no trace of sand or stoppage of the passage. Six or seven horses have already succumbed. [It is impossible to say what was wrong. Possibly poisoning, or inflammation of the lungs.—GEN. SEC.]

Mount Compass, February 9.

Present—Messrs. M. Jacobs (chair), Peters, F. McKinlay, S. Herring, R. Cameron, A. Cameron, F. Slater, W. Gowling, and A. J. Hancock (Hon. Sec.), and visitors.

BUSINESS.—The planting of turnips, swedes, and green fodder, and setting out of cabbage plants recommended as calendar of operations for month. Mr. D. J. Hutton read a short paper on use of Crimson clover. The Chairman reported that his Cleopatra apples grown on dry land were badly affected by bitter pit. [Bitter pit will sometimes occur in fruit of young trees growing in well-drained situations.—GEN. SEC.]

Renmark, January 31.

Present—Messrs. E. Taylor (chair), R. Kelly, H. Swiney, F. S. Wyllie, C. Millar, W. H. Waters, S. R. Cox, J. H. Forde (Hon. Sec.), and two visitors.

MANURING OF ORCHARDS.—The Hon. Secretary read extract from Mr. Krichauff's pamphlet on manuring of vines, and commented thereon. The discussion which ensued turned on the best method of burying the manure deeply enough. Mr. Wyllie said Mr. Chaffey had borrowed his seed-drill, and put the manure down to a depth of 6in. It was possible with the drill to put the manure down 8in. in their soils. Members considered this quite deep enough.

REPAIRING TANK.—Mr. Cox asked best means of repairing cemented tank that had cracked. Pure cement, or two parts air-slacked lime to one of cement, were suggested; in any case care must be taken to keep the surface well wet.

Pyap, February 13.

Present—Messrs. J. Harrington (chair), B. T. H. Cox, C. Billett, J. Napier, H. Mills, J. T. Bankhead, W. C. Rogers (Hon. Sec.), and three visitors.

VINE CUTTINGS.—Discussion on planting and treatment of vine cuttings took place. Mr. Ashworth in reply to question said he preferred only medium growth for cuttings, to be buried in moist soil with only one or two buds above the surface. The cuttings should be about 15in. long. He found the Sultana cuttings the most difficult to propagate. Mr. Harrington advocated the use of the dibble in planting cuttings.

Minlaton, January 19.

Present—Messrs. Jno. Anderson (chair), S. Vanstone, M. Twartz, W. Correll, D. G. Teichelmann, and E. Correll.

HON. SECRETARY.—Mr. Jos. Correll tendered his resignation as Hon. Secretary and member of the Branch, on account of his having left the district. A hearty vote of thanks was tendered to Mr. Correll for his services.

NEW WHEATS.—Mr. W. Correll tabled heads of Boomerang, Waddy, and World's Champion wheats. The latter was considered to be a very promising variety.

Burra, February 8.

Present—Messrs. F. A. S. Field (chair), F. Duldig, W. Heinrich, J. Scott, J. A. Arnold, Arch. McDonald, E. Goodridge, J. Flowers, W. G. Hawkes, Hon. John Lewis, M.L.C., and R. M. Harvey (Hon. Sec.)

WOOL-SORTING CLASS.—Mr. P. L. Killicoat has generously lent his woolshed for use of Mr. G. Jeffrey's wool-classing lessons to students.

CROPS.—On the western part of the district, where fertilisers have been used, the crops generally have been good, in some cases up to 20bush. per acre. The average for the district was fully 12bush. In the hundred of Bunday the crops failed, owing to light rainfall. In Bright the average was 4bush. Baldina crops failed except close to the hills, which gave 3bush. average. Apoina had about 2bush. average. At World's End the locusts did much damage.

EXPERIMENTS.—Mr. Heinrich reported on results of sowing small parcels of wheat, viz., Majestic, Ranjit, Marshall's Hybrid, and Silver King, received from Central Bureau:—Majestic, 6ozs. seed, sown May 5 in rows 9in. apart in open field adjacent to other wheats; came up May 24, stooled well, with dark-green color; fairly solid straw, blighted very badly, attacked by locusts; ripe November 27, yield 39ozs., poor sample, long thin grain; must be good for hay, because cattle eagerly sought every straw. Ranjit, sown May 5, 4ozs. seed; an early variety, light-green color, does not stool, soft white straw, thin long heads, long and bright grain; gave 42ozs. of fair sample. Marshall's Hybrid, sown May 5, 5ozs. seed, early variety, red straw, bearded, stools fairly well, nice long heads, long grain, good sample; cut by locusts; one-fourth harvested gave 59ozs. Silver King, sown May 5, 3ozs.; stools well, healthy color, late variety, long heads, splendid plump grain; cut by locusts; one-fourth harvested, yield 62ozs. not blighted. All samples sown side by side under similar circumstances. Had a poor start on account of want of rain.

EXHIBITS.—Mr. E. Goodridge tabled some very fine Walker's Improved Exhibition onions, grown at Gum Creek without watering.

ANNUAL REPORT.—During years 1899-1900 seventeen meetings were held, and four papers were read, and many discussions took place.

OFFICERS.—Mr. F. A. S. Field was reappointed Chairman, and Mr. R. M. Harvey Hon. Secretary, after both had been thanked for past services.

Millicent, February 7.

Present—Messrs. R. Campbell (chair), W. R. Foster, B. Varcoe, H. A. Stewart, E. J. Harris (Hon. Sec.), and visitors.

HOMESTEAD MEETING.—This meeting was held at Bleakfield Farm, by invitation of Mr. D. Stewart. Owing to the very oppressive weather the attendance was poor. The garden and orchard were inspected by members, and the luscious fruit received considerable attention. On the sheltered side the trees were doing remarkably well. The flower garden was looking very nice. Some good boxthorn hedges were also noticed, but it was complained that they afforded too much harbor for silvereyes and parrots. Tomatoes trained to a trellis of teatree sticks with a wire near the top were doing splendidly. Mr. Stewart failed to get forest trees to grow for several years, but now he has some Aleppo pines and gums thriving. The workshop and smithy was favorably commented on, and a spring dray, constructed on the place from the ironwork of an old dray, received favorable notice. A vote of thanks was accorded to Mr. Stewart and family for the entertainment provided.

COW LOSING MILK.—The Hon. Secretary reported having a cow that lost a good deal of milk while being brought in for milking, and would like to know if anything could be done to prevent this loss.

SPARROWS.—Mr. Foster called attention to ravages of sparrows, and suggested that persons putting in green crops could mitigate the nuisance by spreading poisoned wheat in the field after the birds have picked up the grain left on the surface uncovered. This should be done after the birds have gone to roost; they will come hungry in the morning, and take the bait with good effect. He had killed scores in this way.

PLANTING OF FRUIT TREES.—Mr. Campbell read a paper on "Notes on Planting Fruit Trees."

Naracoorte, February 9.

Present—Messrs. S. Schinckel (chair), H. Buck, J. G. Forster, F. Welcome, A. Caldwell, W. Hastings, E. C. Bates, A. Johnstone (Hon. Sec.), and two visitors.

BAGS IN.—Mr. Forster thought the question of allowance for bags when selling wheat might be considered. The bags cost the farmer 6½d., and when sold with the wheat at present price only fetched 1½d. The Chairman said this matter had been frequently dealt with at Bureau meetings, and at one of the Bureau Congresses, but no plan that would be satisfactory to both buyer and seller could be suggested. In any case it must be remembered that the grower had to pay for the bag in which the wheat was conveyed to the world's market. Mr. Foster said the same trouble existed with flour, a bag of 200lbs. only containing 197lbs. of flour. Mr. Caldwell pointed out that in this case, with flour at 1½d. per lb., the purchaser of the flour gets the advantage.

SEASONABLE NOTES.—The Chairman read the following paper on "Seasonable Notes for the Farm"—

Harvesting operations being over, it is necessary that all implements, wagons, tools, &c. should be placed under cover, to be protected from the hot sun. Where stripping has been done, and straw has to be gathered, it should be done without delay and carefully stacked. If not used for stock as fodder it will be found very useful for bedding down horses (thereby making manure), roofs for rough sheds, and many other things. Haystacks, not already thatched, should be done at the earliest opportunity, as a heavy fall of rain may come and damage a lot of good hay. Where manebolds and kail are grown, and they should be grown on every farm, they should be well hoed with a horsehoe between the rows, so as to get all the benefit of any summer showers that may fall, and keep the ground open and loose. See that all stock is receiving plenty of good clean water. It is very important that sheep should receive a liberal supply of salt, with a little sulphate

of iron, one in fifteen to twenty being about the correct thing. This will be found very beneficial, especially to young sheep, as it helps to keep them in good health during the dry season of the year. Cattle should also receive salt and sulphate of iron in their drinking water, which is a great preventive of impaction, with which we are greatly troubled at this time of the year. Rams should not be with the ewes after January 31, so that the lambing should be over before the weather gets too cold. It is a good plan to give sheep a little chaff when grass is getting scarce. It keeps the young sheep growing well, and prevents a break in the wool, which often occurs at this time, and later. A few tons of chaff used in this way can be very wisely disposed of. It is a good plan at this time of the year, or earlier, to remove all stock from one paddock, so as to let all seed fall, to secure a good thick coat of grass the following year. This should be done with all grass paddocks every few years. On small holdings this may not be practicable, but on large ones it can be done to advantage. Next month I would advise farmers who had land under crop last year, and not intended for cultivation this year, to give it a good harrowing, and sow from five to ten pounds of white mustard per acre, which, with early rains, will give a good crop of green feed for lambing ewes. Many other good grasses may also be tried in the same manner. Prepare land for green feed by deep cultivation. Give plenty of old stable manure, and, when sowing, add a few lbs. of lucern, which might give a very profitable crop. Keep all manure well heaped up; a watering now and again will do it a lot of good. Clean out all pipes and gutters, and see that nothing is left to cause overflowing, which does great damage to walls, &c. Fencing should also be attended to wherever repairs are needed, and a good supply of firewood carted before ploughing commences. Farmers who have not their seed for the present season's sowing should secure it without delay, as later you may not be able to secure what you want; and take care if purchasing elsewhere you do not introduce fresh weeds. All farm implements, vehicles, gates, &c., will be greatly benefited by a coat of paint. Harness should be well washed and carefully oiled. The fields now being minus of crop the sparrows will be found in large numbers around the haystack. Where such is the case they should be killed with poisoned grain or bread. This is an important matter, which is sadly neglected by many farmers. A strict eye should also be kept on the rabbits. Do not think if you have killed your rabbits to the satisfaction of the inspector that that ought to be sufficient; keep on killing as long as you have any to kill, for every one killed now will be one less to breed next season. As the ploughing season is fast approaching all ploughs and harness should be repaired at the earliest, if repairs are needed, as later in the season your blacksmith may be too busy to do the work when required. Fancy a farmer harrowing with dull pointed harrows, which one often sees. He saves a few shillings on blacksmith's bills, but how many pounds does he not lose on his crop, just because the harrows will not do the work as they should do. The same thing applies to a plough out of repair. Strict attention should now be given to poultry, as it is at this time of the year that many of them die. They should always have plenty of good, clean, and cool water. In my mind it is for the want of this that so many people lose poultry during the summer months. Fowl houses should be saturated with sheep dip by the use of a small sprayer, or anything suitable. The sheep dip, I think, is better than lime for keeping down vermin. Stinkwort should now be carefully watched for. Any farmer who has not his land over-run with this weed should make it a practice to pull up every plant he comes across; even those farmers who have large quantities of it should, for the sake of their fellow men, try all means in their power to prevent it spreading all over our district. Any rubbish which may be found in the garden should be cleaned up and burnt. Dig deeply all spare vegetable beds, so as to have a fair tilth for the early planting of various vegetables.

Some members found it very difficult to poison sparrows, as they were too cunning, and seemed to detect poisoned baits by instinct. Mr. Johnstone had put down good wheat regularly to attract them, and then substituted poisoned grain which, however, they would not touch. Poisoned water was suggested, but it was pointed out that this would be of little use owing to plenty of water being available that could not be poisoned; and, besides, the use of poisoned water was considered too risky by some. Mr. Caldwell agreed with the Chairman as to necessity for waging war on the rabbits. It seemed to him that, notwithstanding the trapping and poisoning of late years, they were more plentiful than ever this year. He did not know whether this was due to want of energetic and combined action on part of the landholders. Mr. Forster said the favorable season had afforded every opportunity to the rabbits to increase.

BUSH FIRES.—The Chairman mentioned difficulty in discovering origin of numerous bush fires; some suggested the distribution of phosphorised baits was the cause of many fires. He thought the means of preventing and checking bush fires a very suitable matter for consideration of the Branches. His

brother, who was farming in Victoria, told him he had seen a plough at Nhill which skimmed an 8ft. furrow, turning the soil right over on to another strip 8ft. wide; this made a break 16ft. wide. He strongly believed in ploughing furrows, and burning against them or between them. Mr. Buck suggested planting potatoes or some other crop that would remain green during the summer, but this was considered impracticable. Mr. Forster believed in burning between furrows. The fire that came across Morambro and the plains last week did not injure his holding, as he had run a furrow and burnt against it. Though he was right in the track of the fire he saved his holding, and a big extent of country in addition. A discussion on phosphorus as the cause of fires took place. The Chairman said it should be dissolved in bisulphide of carbon, to prevent combustion. Mr. Hessler believed in dissolving the phosphorus in boiling water; bisulphide of carbon was itself very dangerous. [Unless care is taken, there are many things we use in everyday work that are dangerous. Unless the phosphorus is thoroughly dissolved there is always danger of fire, and with boiling it is exceedingly difficult to do this. If the phosphorus and bisulphide are put in a bottle containing water they sink to the bottom, and the phosphorus will be completely dissolved in about half an hour. So long as care is taken not to inhale the fumes of the bisulphide or expose it near a light there is absolutely no danger.—GEN. SEC.] Members, generally, thought that the best way to prevent the spread of fires was to burn off strips between ploughed furrows. The Chairman mentioned that the recent fire had completely burnt the grass, and destroyed the fowls and some other stock belonging to some of the blockers. He thought it their duty to help the sufferers in any way they could, and offered a ton of chaff. Other members also promised chaff, wheat, and similar help, and a committee was appointed to bring the matter before the notice of the public.

FURZE AS FODDER.—Mr. Buck tabled a sample of furze; it seemed too coarse and tough for stock to eat. Mr. Johnstone said this was the rough variety; there was a softer kind, which stock would eat.

Onetree Hill, February 1.

Present—Messrs. J. Bowman (chair), F. Bowman, J. Flower, F. E. Ifould, E. A. Kelly, and John Clucas (Hon. Sec.).

CROPS.—Mr. Kelly mentioned that portion of a wheat crop "went off" after coming up strongly and heading. The soil was light, with stone near the surface. He thought a too liberal use of manures had produced a strong growth which could not be supported when the dry spring came on. In comparing manures Mr. Flower considered 75lbs. English super. to be equal to 100lbs. Thomas phosphate, and the latter does not give as good results as the former on limestone or Bay of Biscay soils.

RESULTS OF CONSTRICTION ON PEACH TREE.—Mr. Kelly had noted that where a cord had been tied round a limb of a peach tree, cutting into the bark as it grew, there was a heavy crop of fruit, whereas the rest of the tree was barren. [If the cord is left there the limb will be killed. The setting of the fruit was "the effort of nature to reproduce the species" which was in imminent danger of death through partial strangulation.—GEN. SEC.]

TREATMENT OF COWS, &c.—Where a cow or other female has lost her progeny at birth or soon after, trouble often arises through excessive flow of milk. Mr. Flower has often most successfully used a mixture of brandy and butter, in the consistency of thick cream rubbed on the udder two or three times daily.

Mount Gambier, February 16.

Present—Messrs. J. Watson (chair), T. Edwards, J. C. Ruwoldt, J. Dyke, M. C. Wilson, D. Norman, jun., W. Mitchell, W. Barrows, and E. Lewis (Hon. Sec.).

VETERINARY SURGEON.—The Chairman said that Mr G. Sim had spoken to him in reference to the possibility of obtaining the services of a properly qualified veterinary surgeon for this district. In Scotland it was the practice for farmers to unite and raise a guarantee to induce such a man to settle in the district, and when they wanted his services they paid him a small fee in addition. He believed that it was suggested that farmers should contribute 5s. per annum to the guarantee fund. Mr. Edwards said he had been speaking to Mr. Sim about the matter, and it seemed a very desirable suggestion. Several to whom he had spoken favored the idea, and Mr. Clark had promised his support. Other members also thought the idea was a good one, if it could be carried into effect. Mr. Dyke thought there would be no difficulty in getting at least 500 farmers in this and neighboring districts to subscribe to the fund. He thought the Bureau could take the matter up. The Chairman said if a guarantee of £100 per annum could be secured, there would be no difficulty in getting a good vet., as he would have his fees for practice in addition. Further consideration was postponed, members to inquire in the meantime as to the possibilities of giving effect to suggestion.

Yorke town, February 16.

Present—Messrs. J. Koth (chair), A. Jung, C. Domaschenz, J. Latty, J. H. Thomas, C. H. Davey, G. Bull, A. E. Anderson, T. Corlett, and J. Davey (Hon. Sec.).

WHEAT EXPERIMENTS.—The Hon. Secretary reported on wheats received from Central Bureau for trial. He sowed his in plots of two square perches, at rate of 40lbs. seed and 2cwt. mineral super. per acre. Wheat was sown during last week in April, and reaped in first week of December. Silver King yielded 7lbs., equal to 9½bush. per acre, sample good, plant well stooled. Majestic gave 6lbs., grain pinched, plant well stooled. Marshall's Hybrid was much mixed, stooled very well, and ripened a week earlier than the first two; yield, 4½lbs. good grain. Ranjit only gave 3½lbs., and did not stool well. Owing to the continued dry weather after sowing, he had grave doubts about getting seed back, as most of the grain perished in the ground. Had it been sown two or three weeks later, the yields would have been two or three times as much. Majestic and Silver King stooled splendidly, but the former was badly blighted when the ears were about half out. Manure and seed were broadcasted. Mr. Jung brought heads of each kind, well filled, and of fair length. Silver King, Majestic, and Marshall's Hybrid were promising. Mr. Bull reports Ranjit failed, Majestic better than the others. Mr. Corlett reported Majestic and Silver King good, Ranjit poor. Mr. Domaschenz sowed 50z. each, and received 9lbs. Ranjit, 7½lbs. Marshall's Hybrid, and 7lbs. each Majestic and Silver King, both of which were badly blighted. Super. at rate of 80lbs. per acre was applied.

Morgan, February 9.

Present—Messrs. R. Windebank (chair), H. Hahn, R. Wohling, G. Roediger, U. Moll, J. Bruhn, G. Schell, H. H. Plummer, and E. French (Hon. Sec.).

IRRIGATION—Considerable discussion took place on the question of irrigation by pumping from the river *versus* water from artesian bores. Members are unanimously of opinion that water can be raised and distributed from the

river at a price that would pay handsomely, provided judicious selection of fruits to be grown is made. They considered that if Morgan with its possibilities were in America, there would be thousands of prosperous settlers instead of hundreds striving to exist as at present. Some cheaper means of raising the water would be of the greatest benefit.

FERTILISERS.—Some discussion on the use of fertilisers for wheat took place, but it was thought that the rainfall was too small to give them a fair chance. One member, however, intends testing the matter this season.

Eudunda, February 4.

Present—Messrs. J. von Bertouch (chair), E. T. Kunoth, F. H. Walter, J. A. Kluske, H. D. Wiel, H. Martin, C. Wainwright, F. W. Krummel, and W. H. Marshall (Hon. Sec.).

BUSINESS.—A general discussion took place on how to make the Branch more useful. The Hon. Secretary reported that subscriptions toward fund for purchase of purebred bull were coming to hand.

Orroroo, February 1.

Present—Messrs. W. S. Lillecrapp (chair), J. Moody, G. Harding, M. Oppermann, S. Roberts, W. Robertson, R. Coulter, jun., J. Scriven, and T. H. Tapscott (Hon. Sec.).

REPORTS.—Mr. Coulter suggested that each member should prepare a short statement of their experience in practical farm work during the past year, and taking in the method of putting in the seed, the treatment of seed, tilling operations, how the fallow land was treated, how the crop was taken off, and generally which methods of working have given the best results. It was decided to discuss the matter at next meeting.

Forster, February 12.

Present—Messrs. J. Johns (chair), F. Johns, W. Johns, J. D. Prosser, J. Retallack, F. Towill, J. Childs, E. Schenschler (Hon. Sec.), and two visitors.

WHEAT REPORT.—Mr. Retallack sowed 130lbs. Dart's Imperial wheat, and harvested eight bags. Considerable damage by hailstones prevented a larger yield.

SANDY SOILS.—Mr. F. Towill read a paper, "How to Work Light Sandy Soil." He would clear the land, plough it, drill in 30lbs. seed with 40lbs. superphosphate. Next year he would use 60lbs. super., and drill the land only to keep the surface trim and prevent drifting. He would sow only early varieties of wheat, such as Early Para, Steinwedel, and Gravestock's Frampton.

DRUMMOND'S SPURGE.—A member tabled a plant of *Euphorbia Drummondii*. He said it was commonly believed to be poisonous. [The weed grows flat upon the ground, covering a radius from 6in. to a foot; has purplish-red stem and branches; leaves closely attached without leaf stalk, oval, light green, in pairs, a little over $\frac{1}{2}$ in. long and 7in. broad. Plant much branched, and generally grows on reddish sandy lands. If sheep or cattle are hungry, and eat of this plant ravenously, they become bloated, or affected with tympanitis. Sometimes whole flocks of sheep have been killed in this

way. When animals are not ravenously hungry they may feed upon this plant without any evil consequences. Sheep have been shut up for six weeks and fed exclusively upon this Drummond's Spurge without any evil effect. In any case of bloat, the remedy is simple. For a horse or cow, give a tablespoonful of carbonate of soda in a wine bottle of water. For sheep, give one-third of the quantity.—GEN. SEC.]

Watervale, February 18.

Present—Messrs. C. A. Sobels (chair), G. Hunter, S. Solly, H. Beck, H. Scovell, J. Thomas, G. Holder, B. Perrin, and E. Treloar (Hon. Sec.).

EXHIBITS.—By G. Hunter—Beauty of Australia apple, and one similar but with better flavor; also three varieties plums. By Mr. Holder—Greengage plums, later than the ordinary sort, and of a bright green color.

Kapunda, February 9.

Present—Messrs W. Flavel (chair), W. M. Shannon, J. O'Dea, T. Scott, J. H. Pascoe, Peter Kerin, E. Weckert, J. H. Schultz, G. Teagle, and G. Harris (Hon. Sec.).

EXHIBITS.—Mr. Teagle tabled rape seed for distribution. This was from seed originally received from the Bureau, and was a good fodder for cattle. Mr. Pascoe showed good onions grown from Bureau seed. Mr. Shannon recommended ensilage for horses, especially for young animals.

MANAGEMENT OF FARM HORSES.—Mr. O'Dea read a paper on this subject:—

He said the management and feeding of farm horses was a subject which was of considerable importance to the farming community and the public at large. He would only briefly allude to a few facts based upon his own experience. He was much in favor of horses being well fed, groomed, and attended to, because if so treated their pace and powers of endurance were increased considerably. He had proved this beyond question in regard to racehorses, of which he had had some experience. A team of four horses in good condition, if properly cared for, would do more work and with greater satisfaction than a team of six horses of the same class half starved and neglected. It was a mistaken economy to allow the farm horses to drift into too low condition, especially towards the end of summer. Once a horse was in really good condition it was not much trouble to keep him so, but if he was poor at the commencement of seed-time it was impossible to put condition on him for some time. Just after harvest the working horses did fairly well in the stubble, when idle for about four or six weeks, if they got plenty of good water to drink. Leaving them, however, too long in the stubble to find their own forage they ate a quantity of earth and rubbish with the straw, and in very many instances were brought in to commence the seeding work in a condition quite the reverse of what it ought to be. At that time of the year each farm horse ought to be given a dose of Glauber salts or linseed oil, which had a cleansing effect on their intestines besides being of benefit to them in other ways. Of course, this is not absolutely necessary in cases where the animals have been well looked after. At the beginning of seed-time he thought it was of great importance that the farm horses should be fresh and in really good fettle, as they had a lot of laborious work to do and a short time to do it in, and they required all the attention that could be bestowed to keep their condition to the end of seed-time.

With regard to feeding, horses like a change of diet like human beings. Mixed hay, oats, and wheat, he preferred to all wheaten hay, and by all means hay chaff from sheaved hay, which was much cleaner and better cut than chaff from loose hay. During the winter months, from May to August, crushed wheat with the chaff damped with water carefully for the mid-day meal, as it was warm and nutritious. Oats were, of course, a splendid fodder for horses as they put life and vigor into them, and had a tendency to put on muscle without too much fat, and thereby increasing good wind and power of endurance—a quality that was not possessed to the same extent by any other cereal. The horse was an animal that was very sensitive to cold for several months of winter. A cover at night was a great benefit to them, and they kept their condition better. In bleak, open stables, such as many of the farmers have, some clothing—bagging material would do very well—was necessary. The cost for each horse need not exceed 2s. or 3s., and it would last many years. Horses like clean, fresh water, which was best for them, especially during summer. Working horses did not suffer so much from thirst with the

use of it as they did from brackish water. Horses seemed to do very well on good water from wells. But the water must be pure. There was nothing more likely to communicate disease than impure water. He had formerly had some loss and trouble with his horses from the effects of well water that had become polluted owing to being situated too near the stable, and he understood that a similar trouble had occurred in various parts of the colony. A run out to grass in a good paddock in the spring of the year for about three or four weeks was absolutely necessary. Last, but by no means least, was a reference to their working collars, which, he believed, in very many instances, were neglected, and horses allowed to suffer with sore shoulders through bad fitting collars, which could be prevented with a little care and attention and acting on the good old principle that a stitch in time saves nine. Sore shoulders, as a rule, were easily prevented if attended to in time, but if through neglect a wound was allowed to fully develop it meant not only much suffering, but perhaps the loss of the services of the animal for some time. He considered the law in force in this colony in respect to sore shoulders a wise and humane precaution on the part of the authorities. Collars required to be stuffed and attended to at regular intervals by a saddler. At the same time farmers and drivers of horses could do some of the work themselves. Whilst in favor of medium long swishy tails as a protection from flies and insects, he thought that if some of the superfluous hair was removed from some of the tails of farm horses and put in the collars they wear it would be more use to the horses. Crushed barley was good corn for winter use, and when horses were at hard work a bran mash once a week and some green feed daily, when it could be obtained, was very requisite for their health and condition. In his opinion the majority of farm horses did not get as much salt in their food as they required. When out at grass in the winter, or if they got an allowance of green feed daily, they did not suffer so much in that respect as nature provided in green feed a percentage of salt. He always put a sufficient quantity in their corn bin, so that each animal when at work got a daily allowance of one or two tablespoonfuls. Grooming the farm horses was an important duty once a day, and it never should be neglected when horses were working. It was good for their health and working capabilities. He had observed that they kept their condition better if shod whilst reaping and carting.

Mr. Teagle said he had tried crushed wheat for feeding horses and thought it was too heating, but mixing one bag of bran with two of crushed wheat was good.

Balaklava, February 9.

Present—Messrs. C. I. Reuter (chair), G. Reid, A. Mauley, W. H. Thompson, W. Smith, J. Crawford, J. Vivian, W. H. Sires, W. Tiller, and E. M. Sage (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. Crawford reported having sown 3lbs. Ranjit wheat with super. at rate of 1cwt. per acre, broadcasted, portion of the land being stiff clay, and portion being sandy. The wheat did very well, and, although a little blighted on the stiff ground, he got back 65lbs. of grain. The variety was fairly early, and he intended sowing it again. Mr. Smith broadcasted Majestic wheat on May 11 on land into which 80lbs. super per acre had been drilled. It stood well, and withstood the dry weather, and was true to type; 1½lbs. seed sown returned 50lbs. good grain.

FALLOWING.—The question was asked as to which was the better, to burn off grass from land to be fallowed or to plough it under. Members thought it risky to plough it under a lot of rubbish as, unless plenty of rain follows, it will not rot thoroughly, and the land would, therefore, be more liable to takeall. It was considered best to feed the land as bare as possible with sheep.

MANURING BEFORE SEEDING.—Paper read by Mr. R. Marshall at latest Conference was discussed. Mr. Smith and Mr. Reed did not think the crop could be put in any cheaper by drilling the fertilisers in early and broadcasting the seed afterwards, as just as much labor would be involved as in drilling in both seed and fertiliser together. Other members, however, thought there would be a saving in any class of soil, as the work would not have to be rushed, the drill would work much lighter earlier in the season, and seeding operations could be finished sooner, which often meant a better return at harvesttime. Mr. Tiller said his brother had tried the two systems side by

side, and where the seed and fertiliser were put in together the crop was far better in appearance than the other, but they were not reaped separately. [And so a valuable experiment is spoiled for the saving of a little trouble.—GEN. SEC.] Members thought it not possible to judge the result altogether by appearance; while there might not have been so much straw on the portion which had its manure applied first, and the seed afterwards broadcasted, the grain would probably return better than appearances indicated. Mr. Sires knew of an instance where a bag to the acre more had been reaped from land which was manured early, and seed broadcasted, than when both were put in together with the drill. Mr. Vivian said a portion of his crop which was broadcasted, both seed and manure, was as good as any he had drilled. A neighbor of his got 17bush. per acre from land which he manured during the dry weather with the drill, as against 12bush. from the portion on which the seed and manure were applied at same time. Members were of opinion that it was immaterial, as far as the crop was concerned, how the manure was put into the ground so long as it was there.

EFFECT OF FERTILISERS.—In discussion at previous meeting on alleged blighting of the crop in dry weather, resulting from the application of 1cwt per acre or more of super., the Hon. Secretary was reported to have said he applied 1½cwt. super. per acre to newly ploughed land, and had *some* of the crop blighted. This should have read *none* of the crop was blighted.

Bakara, February 1.

Present—Messrs. R. Barrow (chair), J. V. Barrow, E. Hayward, E. Wall, T. Hermann, and F. E. H. Martens (Hon. Sec.).

BUNT.—The Hon. Secretary tabled heads of wheat, portions of which contained sound grain and the other portion being bunted.

WHEAT EXPERIMENTS.—Mr. Barrow showed samples of various wheats grown from seed distributed last year by the Central Bureau. Other members reported on their experiments with these wheats, in most cases Marshall's Hybrid yielding the largest amount of grain.

STUBBLE BURNING—Most members prefer burning the stubble to ploughing it under, owing to the long time it takes to thoroughly decay, thus keeping the soil too loose.

POISONS.—Mr. Hayward asked whether it was safe for persons with sore hands to handle strychnine or arsenic, or whether they were stomach poisons. [I have known of several cases where men handling arsenic with hands having very slight scratches on them have suffered severely in consequence. Anyone who handles strychnine, having the slightest sore, or suspicion of a sore, upon his hands should previously make his will, and it would be as well to notify the coroner.—GEN. SEC.]

Minlaton, February 23.

Present—Messrs. J. Anderson (chair), J. McKenzie, D. G. Teichelman, James Anderson, W. Correll, J. D. Mayer, James Martin, T. Brown, A. McKenzie, H. Kennedy, S. Vanstone, and two visitors.

HON. SECRETARY—Mr. J. D. Mayer was appointed Hon. Secretary *vice* Mr. Joseph Correll, resigned.

FERTILISERS.—It was decided to discuss at next meeting the kinds and quantities of fertilisers used in this district and the results obtained.

Riverton, February 8.

Present—Messrs. W. Hannaford (chair), T. Gravestock, J. Kelly, M. Nash, A. S. Martin, A. J. Davis, F. Calf, H. A. Hussey (Hon. Sec.), and one visitor.

SEED WHEAT FUND.—The Hon. Secretary reported having collected in cash and wheat equal to thirty bags, for assisting farmers who lost their crops last year to sow their land again. It was decided that the wheat be sold locally and proceeds remitted to the originators of the movement, *i.e.*, the Wilmington Branch. It was also decided that several of the members be appointed to obtain further donations. The Chairman eulogised the Hon. Secretary for having started the fund, and, while gratified at the result of his efforts, he thought that, considering the splendid harvest throughout this district, more should have been available.

Crystal Brook, February 9.

Present—Messrs. J. C. Symons (chair), W. J. Venning, R. Pavy, G. Davidson, A. Hamlyn, P. Pavy, W. Natt, W. Hamlyn, and F. S. Keen (Hon. Sec.).

PAPERS.—Papers by the Chairman and Mr. Venning on "Can Farm Life be Made more Attractive?" and "Best Method of Disposing of our Surplus Products," respectively, were read and discussed. These papers were also read at Conference of Branches held at Gladstone.

Tanunda, February 22.

Present—Messrs. J. H. Walden (chair), A. Bietz, T. Sage, F. W. Graetz, J. Gurr, W. Liddiard, G. Trimmer, G. Mann, A. Ohlmeyer, C. Heinemann (Hon. Sec.), and one visitor.

DAIRYING.—The question of purchasing a pure-bred bull for service in the district was discussed, but decision postponed pending further inquiry.

VINEYARD CULTIVATION.—The judges appointed to inspect vineyards entered for prizes offered for best cultivated vineyards reported in favor of Mr. M. Burge, of Lyndoch, as first; and Mr. F. W. Mattner, of Trial Hill, second. The cultivation of vineyards is receiving considerable attention from the wine buyers and makers, and more and better prizes are likely to be offered next year to encourage good cultivation. A vote of thanks was accorded to Messrs. A. Bietz and T. Brock, who acted as judges. A discussion took place on the different methods of cultivation and training of vines.

Port Elliot, February 16.

Present—Messrs. J. McLeod (chair), J. Brown, H. Green, sen., W. E. Hargreaves, H. Pannell, J. Nosworthy, J. R. Coote, C. Gosden, H. Welch, O. B. Hutchinson, and E. Hill (Hon. Sec.).

COMPLAINT.—Mr. Hargreaves complained of the condensation of his paper by the editor of the *Journal of Agriculture*. It was agreed that the Chairman should (with Mr. Hargreaves) compare the manuscript with the print.

FRUIT-PRESERVING.—Mr. Green read a paper on this subject, and tabled samples of Zante currants, grapes of this season's growth. The following is a full digest of Mr. Green's paper:—

Papers read at Bureau meetings by members usually concern local interests, and many in other localities find the information given is beyond their power or adaptation from various causes. Being myself interested for some years in fruit culture, I find the best school is actual experience. I find that trees after twenty years or less show signs of dry rot, and dead wood

in the butts—peaches and plums more than others—and as trying to restore an old tree will probably have that result, I would rather replant young trees than risk it. Another matter. Apples and pears that are exposed to direct sun heat are the first to decay in the storeroom. Many think in fruit-growing that you are only to plant and the job is done. But to do as it should requires attention and labor the whole year, more or less. Everywhere we find people planting fruit trees, and the future for the disposal of the crop is not very bright. As for export, there are only apples and some pears, and nine-tenths of the growers cannot take advantage of it. [What about Broken Hill, West Australia, and the eastern States?—GEN. SEC.]. But my paper is more in reference to fruit-drying. All instruction I have read on the subject is of very little use without actual experience before it can be properly managed. The first requirement is an evaporator, or drying-room. It is useless to attempt any quantity without, as it will result in most certain loss in the open air. Trays required may be of any handy size, $\frac{1}{2}$ in. wire netting or pine laths. The fruit must be perfectly ripe. The loss in weight is as follows:—3lbs. grapes make 1lb. dried; 5lbs. apricots, 1lb. dried; 1gall. of plums, 2lbs. dried; 6lbs. quinces, 1lb. dried; 6lbs. to 8lbs. apples, 1lb. dried; 6lbs. pears, 1lb. dried. Fruit grown in too damp soil is poor in quality, and loses more in drying. If appearance is of more consequence than flavor, all light-colored fruit must be sulphured in a separate room or box. The currant grape can be dried in the open air. I find it takes about six days, but it requires a deal of attention and trouble, with the addition of dust and insects. In a room apricots, apples, pears, quinces, twenty-four hours is sufficient for drying. Grapes require dipping in hot potash lye to soften the skin, and it assists the drying. Plums must be dried slowly the first two or three days; otherwise the pulp oozes, and most is lost. Afterwards the heat can be raised, but care must be taken that fruit as it dries is not scorched. All moisture must be evaporated or they are sure to mould. As the fruit is taken from the drying (excepting grapes) it must be put into calico bags, or boxes with lids, to prevent moths depositing eggs, also to equalising the drying process by sweating. Dried fruit requires boxing and pressing. Plums must be dipped in hot water to soften the flesh. You can keep fruit longer by drying, but to be at its best ought to be used within twelve months; otherwise it hardens. Some other uses for fruit are bottling, canning, pulping, with or without sugar, and concentrating the juices for drinks. They all require sealing whilst boiling hot; otherwise they will ferment. Damaged fruit and parings and cores from apples, pears, quinces, grapes, &c., can be manufactured into vinegar—so there need be no waste. I have also succeeded in curing olives (which are a good substitute for butter) and oil-making. I could not locally dispose of all the fruit I dried. Currants gave the least trouble, and were in best demand. The great difficulty is the birds; you cannot leave the fruit to ripen as it ought to be. If you did there would be none to pick. The currant grape ripens early, and this is in its favor. The Muscatel and Gordo Blanco do not ripen early enough to be a success.

Ampton, February 7.

Present—Messrs. W. Gum (Chair.), R. Brown, W. Hawke, H. Gray, H. Turner, Thos. Gum, and S. Thomas (Hon Sec.).

DAIRYING.—Considerable discussion took place re obtaining Jersey bull for service in the district, and it was decided to ascertain if a sufficient number of members would subscribe for the purchase of a bull.

HON. SECRETARY.—Mr. Thomas tendered his resignation as Hon. Secretary, a position he has held since the inception of the Branch. A hearty vote of thanks was tendered him for his services, and Mr. H. Turner was appointed to the vacant position.

Arden Vale, February 4.

Present—Messrs. E. H. Warren (chair), M. Eckert, C. Pearce, G. Willis, F. Schuttloffel, A. M. Fricker, P. Starr, J. H. Willis, W. Willis, A. Hannemann (Hon. Sec.), and three visitors.

DRILLING AND MANURES.—Mr. S. Venning, of Mount Arden Farm, gave some interesting particulars of results obtained there last season. The returns from the early-sown wheat were good, some Purple Straw on fallow land yielding 19bush. per acre. Red Straw, Smart's Purple, Steinwedel, and Marshall's Early gave from 10bush. to 14bush. A long discussion ensued, a number of

members being of opinion that while the practice of drilling in the seed and manure would pay well with a sufficient rainfall, they did not believe it would pay in most of the dry northern areas.

HARVEST.—From information collected by members it was estimated that the yield of the hundreds of Yarra and Wyacca was about 3bush. per acre. The rainfall recorded at Wyacca for the year was 10·5in., and at Arden Vale, 10·8in.

Penola, January 12.

Present—Messrs. E. A. Stoney (chair), W. Miller, W. P. Davis, S. B. Worthington, T. H. Morris, L. W. Peake, Dr. F. Ockley, R. Fowler (Hon. Sec.), and one visitor.

REPORTS IN "JOURNAL."—A complaint was made that the reports of meetings of this Branch in *Journal of Agriculture* were much curtailed. The Hon. Secretary said his reports were moderately full, but they were cut down by the editor. [Quite true. The present report was received on February 28, only forty-seven days after the meeting was holden.—GEN. SEC.]

NIGHT GRUBS.—Mr. Stoney said he had tried the bran mixture for suppression of the night-feeding caterpillars; it was totally useless. [Hundreds of cultivators all over Australia have found the bran, arsenic, and sugar mixture absolutely reliable, and this is the first recorded failure. Is it possible that the mixture was wrongly composed?—GEN. SEC.] He was now spraying with white arsenic, and would report later on. He would like some members to try gas lime. Mr. Worthington said growing onions between the trees was efficacious in keeping down the night grub.

AGRICULTURAL COLLEGE.—Some members are of the opinion that a site might be advantageously secured in this district for the training of young people in the cultivation of vines and fruit trees, and in the rearing and management of stock, &c., with greater facilities than are prevalent at Roseworthy.

Rainfall.—For year, to December 31, 24·63in.

Penola, February 16.

Present—Messrs. E. A. Stoney (chair), H. Ricketts, E. McBain, W. Miller, J. D. Wilson, T. H. Morris, D. McKay, F. B. Worthington, R. Fowler, Dr. F. Ockley, R. Fowler (Hon. Sec.), and one visitor.

STOOKING HAY.—Mr. Stoney wished to know how much hay a man should stook in one day, and was informed that eight to ten acres of a fair average crop was a good day's work.

CONFERENCE.—The Conference of South-Eastern Branches was fixed to take place at Penola on April 24, and a strong committee was appointed to arrange details.

ROSEWORTHY COLLEGE.—Most of the members agreed that whilst climatic conditions are unsuitable at the Agricultural College for grape vines and fruit trees, still one branch of the agronomical work cannot with advantage be carried on at a distance from the rest. Mr. McKay thought that sufficient chances are not given to country boys to secure scholarships for Roseworthy. Very few seemed to know what conditions were required in order to compete, when the exams. took place, what were the subjects, &c. It was resolved to ascertain if there are any boys attending the State schools who are fitted and willing to enter and compete for a scholarship.

Finniss, February 4.

Present—Messrs. Jas. Chibnall (chair.), S. Eagle, H. Langrehr, A. Green, S. Collett (Hon. Sec.), and one visitor.

BUNT—Some discussion on this subject took place. Members hold different opinions as to result of pickling. Some find that, pickle how they may, on particular lands the crop will be affected, while on other land the wheat will be free.

VEGETABLE-GROWING.—Mr. Green read a paper on raising vegetables. His practice was as far as possible to save seed himself, not to use seed more than two years old, and to raise plants under glass, setting them out when of convenient size. Care must be taken to water the plants well after setting them out. For open beds he sows radish with carrots or parsnips. In a few weeks the former are fit to pick, so that two crops are growing at the same time on one plot.

Lyrup, February 19.

Present—Messrs. A. Menzies (chair), P. Brown, A. Pomeroy, D. J. Tree, W. H. Walling, A. Weaver, G. A. Bollenhagen, T. R. Brown, T. Nolan, O. Klemm, W. H. Wilson (Hon. Sec.), and three visitors.

HARNESSING A BULLOCK.—Mr. R. Brown said he had been told that the harness for a single bullock in a dray is put on the same way as with a horse, except that the collar should be put on upside down. Mr. Tree said the collar should be put on the right way first, and then be turned round; he preferred the collar to the yoke and bow, as the bullock could pull much more with less labor and pain.

BEES.—Mr. Nolan had found that bees would work well on strips of plain wax, and Mr. Menzies had tried strips of calico in place of foundation, and this answered very well.

EXHIBITS.—Mr. Klemm tabled five mangolds, grown on stiff soil, without manure. They were planted out four months ago, and weighed 6lbs. or 7lbs. each. Mr. Walling tabled three fine large tomatoes, name unknown. Mr. Menz tabled four varieties of onions, grown from Central Bureau seeds, viz., Maggiola, New Queen, White Globe, and Neapolitan, all round and well grown, but as they were all pickling onions, they were not appreciated so much as James' Long-keeping or Brown Spanish.

MAIZE.—In order to get a second cut from a crop of maize, the first cut should be made when it is about to flower, when 2ft. high. It should be cut about 3in. above the soil, and must be grown on fairly good soil.

REWARD FOR THE DISCOVERY OF PHOSPHATES.

Office of the Minister of Education and Agriculture,
Adelaide, January 20, 1900.

Rewards are hereby offered for the discovery and working within the colony of a deposit or deposits of marketable mineral manure, as under:—

1. £500 if found on Crown lands; £250 if found on freehold lands.
2. If found on Crown lands, the discoverer will be entitled to a lease of the land upon which the discovery is made, in terms of Part VI. of the Crown Lands Act of 1888, providing for a lease of 640 acres for twenty-one years.

3. The above rewards will be payable to the discoverer at the Treasury, Adelaide, on the certificate of the Professor of Agriculture that the following conditions have been complied with :—

1. That the deposit is easily accessible, and within a reasonable distance of a railway or seaport, and not within twenty-five miles of any discovery on account of which any bonus has been paid.
2. That the deposit is sufficiently abundant, and is available at a price which will allow of it being remuneratively used for agricultural purposes.
3. That the product is of a good marketable quality, averaging not less than 40 per cent. of phosphate of lime, provided, however, should a phosphate of a lower average composition be discovered, the Professor of Agriculture may recommend that a portion of the reward be granted.
4. The terms of payment will be $\frac{1}{5}$ (one-fifth) on the production of the first 200 tons; the remaining $\frac{4}{5}$ (four-fifths) to be paid, $\frac{1}{5}$ (one-fifth) on production of each additional 200 tons.

Applications, addressed to the Minister of Agriculture, Adelaide, will be received up to and including the 31st day of December, 1902.

E. L. BATCHELOR, Minister of Agriculture.



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and found Employment by Government Departments and Private Employers from February 1 to 26, 1901.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youth laborers	79	173	245
Carpenters	4	1	—
Bricklayers, masons, and plasterers	1	1	5
Boilermakers, blacksmiths, and assistants	6	3	3
Riveters, iron and brass moulders ..	—	—	1
Fitters and turners	5	2	1
Enginedrivers and stokers	—	1	—
Apprentices	19	2	—
Cleaners and glut cleaners	12	10	7
Carriage-washers and junior porters	32	20	3
Painters and improvers	9	2	1
Cook and sculleryman	—	—	2
Compositors	1	—	—
Electrical engineer and assistant	1	—	—
Printer, bookbinder, and finisher ..	3	—	3
Master mariner	—	1	1
Plumber's assistant	2	1	—
Tram conductor	—	—	1
Brass finisher	—	—	1
Deck hand	—	—	1
Barman	—	—	1
Woodcutters	—	—	4
Totals	174	217	280

February 28, 1901.

A. RICHARDSON, Bureau Clerk.



Journal of Agriculture

AND

Industry.

No. 9. REGISTERED AS]

APRIL, 1901.

[A NEWSPAPER. VOL. IV.

NOTES AND COMMENTS.

While the past month has been somewhat disappointing to the farmers, particularly those in the earlier districts and those depending upon tanks and dams for water, the cool dry weather has, on the whole, been favorable to the winemaker, and the vintage has proved very satisfactory. Favorable reports continue to be received from the pastoral country, vegetation having made splendid growth since last month's rains. The slight rise in the London wool market is also a satisfactory feature. Large numbers of seed drills have been imported this year, and seeding has commenced in the earlier districts.

— — — — —

The Department of Agriculture propose to undertake experiments during the coming season to test whether cereal crops can be profitably grown with the aid of commercial fertilisers in the so-called Ninety-Mile Desert. Small areas alongside the railway line in different localities between Cooke's Plains and Keith will be sown with wheat, and wire-netted to protect the crop from rabbits. Average quality of land comprising the different soils characteristic of the district will be selected. Since the introduction of the seed and fertiliser drills good crops have been grown in other districts with lower average rainfall and on similar soil. If it can be demonstrated that cereal cultivation will pay in the locality in question under improved methods of farming it will be of great benefit to the State, as there are hundreds of thousands of acres of Crown lands in the so-called desert within easy reach of the railway line that could be settled. It is interesting to note that fourteen or fifteen years ago the editor of this journal suggested that this land should be so tested.

— — — — —

The Hon. Minister of Agriculture has issued instructions for the small wheat-testing mill, obtained some time since by the department, to be erected at the Roseworthy Agricultural College. The chemist attached to the college staff has gone to Sydney to consult with Mr. F. B. Guthrie on various matters in connection with the erection and use of the mill, and it is hoped that it will not be long before farmers can have small quantities of new varieties of wheat tested for their flour-making qualities at the college.

Owing to the late arrival of several vessels containing large quantities of fertilisers, both merchants and importers have been put to considerable inconvenience. The demand for these fertilisers has been very active, with the result that there is a decided shortage in the supplies of imported fertilisers. Those farmers who neglected to order their supplies early have not only experienced considerable difficulty in obtaining their requirements, but have also had to pay an enhanced price for same. Fortunately the local manufacturers have increased their output to a considerable extent, an active demand existing for same. Had there been a plentiful supply of fertilisers available the coming season would have shown an exceedingly large increase in the area manured over that of last year.

It is reported that immense deposits of nitrate of soda have been discovered in the Death Valley, California. Professor G. E. Bailey states that the section is as rich in nitrates as the famous nitrate districts of Peru. He says that the deposits of nitrates are formed by the subsidence of the ocean. In this instance the rising of the Sierra Nevada mountains left a large portion of the ocean without any outlet and with an insufficient inflow of water to balance the evaporation, the result being that vast deposits of chemicals carried in the seawater have been made. This will, if it proves correct, be good news to American cultivators in particular, as immense quantities of nitrate of soda are used there. Other countries will also benefit from an increased supply and cheaper price for this important fertiliser.

The demand for fertilisers throughout the world seems to be steadily increasing, and it can only be a matter of time for the prices to increase unless new deposits of considerable magnitude are developed. Nitrate of soda has already shown the effect of the enormous consumption of late years. Throughout the world the demand for bone fertilisers is practically in advance of the supply, and prices are high. America ships crude phosphates all over the world, but principally to Europe. In 1899 she exported 812,604 tons, Great Britain taking 95,000 tons, Germany 191,000 tons, France 41,000 tons, and the rest of Europe 186,000 tons. It must be remembered, too, that Europe produces very considerable quantities of crude phosphates, phosphatic slags, and also imports largely from countries other than the United States. The consumption of phosphates in America is also immense, while large quantities of bones, blood, offal, and other animal matter from the slaughter yards are converted into manures. The official records of one State (Georgia) show an annual consumption of nearly half a million tons of fertilisers. Several other States are equally large consumers, some even exceeding this amount. Throughout America the demand is rapidly increasing, the aim of all being to produce an increased crop on smaller areas through the judicious application of fertilisers.

Nearly every farmer wants to know why the very best samples of wheat are paid for with no better price than is given for wheat that is only of average standard quality, whilst wheat that is anything below standard quality is "docked," or has a lesser price paid for it than is given for standard quality. If a farmer has 100 bags wheat weighing 66lbs. per bushel and 100 bags weighing 61lbs. per bushel he would get less for the lot if he sold them

separately than if he mixed them to bring them to the average. There is certainly no inducement to raise the standard quality of our grain, and the sooner this unsatisfactory state of things is altered the sooner will satisfactory progress be made in recovery of our lost reputation of producing the best wheat in the world.

The Secretary of the Agricultural Bureau has received small quantities of several hardy perennial American grasses. These are highly spoken of, and should be worthy of careful trial in South Australia. Any member of the Agricultural Bureau who would give some of these grasses a trial can obtain one or two small packets on application. In the past few years a number of hardy grasses have been distributed by the Bureau, but the results have not been satisfactory, partly owing to the exceptionally dry springs experienced.

While most of our readers are aware of the enormous development of the pastoral industry in New Zealand, more particularly the rearing of sheep and lambs for export, few have any idea of the extent to which the stock depend upon cultivated crops. The New Zealand *Gazette* of March 8 contains some interesting particulars of the area sown with green crop and grasses. The grass area is given as over 33,000,000 of acres. Green crops, mainly turnips, 404,313 acres; and rape, 124,318 acres, amount to 638,804 acres—a falling off from previous year of nearly 33,000 acres. The number of sheep is returned as 19,355,195, of cattle 1,256,680, and of swine 250,975.

Fresh butter was sold by produce auction a few days ago at 1s. 7d. per pound. At the same hour and place other parcels of butter were sold at 7d. Here was a dead loss of 1s. on each pound of butter made from milk quite as good as that from which the high-priced butter was made. No one benefited by the reduced price, but the stuff made was not nice by any means, and, if used without cooking, would last a long time on the table, to the exclusion of several successive pounds of good butter. What was the cause of difference in price of these butters? There is something very wrong in the treatment of the milk and cream, and the worst of it is that many of the people who make this "cheap and nasty" butter feel sure that they know more about dairy work than does the Dairy Instructor.

A dairy factory milk supplier, when rebuked for neglect of precautions to preserve his milk from contamination, replied that the matter did not interest him, or, in his own slang, "My troubles." But he was wrong there. If the manager of the factory should receive contaminated milk and mix it in the tanks with the sound milk the whole bulk will be affected, and the butter or cheese made from the bulk will be deteriorated; every other supplier will suffer, and the manager's reputation will be damaged also. For the protection of the public health, dairy suppliers' pockets, and the reputation of the factory managers there should be frequent inspections of dairies and dairy stock by competent men. Directors, too, should uphold the manager of their factory in refusing tainted or objectionable milk, even if it should be sent from their own farms, as is sometimes the case.

How careless we are in respect to the nature of the stuff we purchase and use as food. Anything, for instance, sold as "vinegar" is accepted as genuine, and yet the great bulk of the cheap acidulous liquor that is sold under that name consists of more or less deleterious acids, dissolved in water and colored with burnt sugar. If we had any proper respect for our health and digestive organs, we would see to it that our vinegars were the fermented product of grapes, or apples, or honey, malt, or some other wholesome substance. Wine and cider vinegars are to be preferred, but malt or honey make excellent and perfectly wholesome vinegars.

The bacillus or germ of tuberculosis cannot live for longer than five minutes under a temperature of 180° F. Therefore, if meat is properly cooked, or milk is kept at nearly boiling point for ten minutes, either of those substances will be quite free from possibility of infecting the consumer with tuberculosis or consumption. Many people dislike boiled milk, but if the temperature is not raised above 200° F. there will be no "cooked" taste in it. Were every person to observe these simple precautions many thousands of human lives would be saved annually.

Some experiments have been tried to prove the relative effects of rolling and harrowing upon the yield of oat and barley crops. The seed was drilled on well-prepared land in every case. The results were as follow:—Where the seed was drilled only, and left to nature, the yield of oats was 51bush. 16lbs.; drilled and rolled, 49bush. 9lbs.; drilled, rolled, and harrowed, 55bush. 5lbs. Barley, drilled only, 24bush. 10lbs.; drilled and rolled, 23bush. 8lbs.; drilled, rolled, and harrowed, 26bush. 2lbs. These experiments prove, what has often been proved before, that harrowing a crop of cereals will prove beneficial, and that a caked or compacted surface will diminish the vitality of the plant and decrease the possible yield.

The apple export for the present season promises to show a large increase over last year's figures. Up to the end of March the following shipments had been made:—

	Hobart.	Melbourne.	Adelaide.
Steamer.	Cases.	Cases.	Cases.
Ormuz	13,340	2,227	1,802
Arcadia	10,126	750	251
Sarpedon	7,267	605	4,160
Oruba	6,300	576	171
Oceana	12,220	2,750	3,330
Austral	18,000	2,791	2,382
Britannia	14,100	2,078	183

In addition, the following shipments to oversea ports have been made from South Australia:—Ormuz, 40 cases for Colombo; Arcadia, 185 cases for Colombo; Oruba, 64 cases for Colombo; Sarpedon, 174 cases for Liverpool; Oceana, 125 cases for Bombay.

A great deal of valuable fruit has been lost this season through codlin moth caterpillars, and not a small quantity, also, through the caterpillars of an indigenous moth, a species of *Cacaesia*, which attacks all sorts of fruits, including tomatoes. Officers of the United States of America Department of Agriculture, and a great many American fruitgrowers, assert most positively that three or four sprayings with Paris green or arsenate of lime will save from

90 to 95 per cent. of the fruit, at a cost not exceeding 1s. per tree where a large orchard is concerned. This spraying is so effective in preventing damage by codlin moth caterpillars that many growers neglect bandaging the trees and gathering up the "wormy" fruit; but it is strongly advised that this work should also be performed.

An American paper, in summarising the value of ensilage, says that twenty years' experience in the use of the silo has brought out some facts about which all are agreed. First, that a larger amount of healthful cattle food can be preserved in the silo, in better condition, at less expense of labor and land, than by any other method known; second, that silage comes nearer being a perfect substitute for the succulent food of the pasture than any other food that can be had in the winter; third, 30lbs. a day is enough silage for an average-sized Jersey cow; larger cattle will eat more; fourth, a cubic foot of silage from the middle of a medium-sized silo will average about 45lbs.; fifth, for 182 days, or half a year, an average Jersey cow will require about 6 tons of silage, allowing for unavoidable waste; sixth, the circular silo, made of good hardwood staves, is cheapest and best. Where the soil is fairly solid to a depth of 16ft. or more, the silo may be filled without walls of brick or stone; but where a silo can be built with walls and cemented, the extra cost will be compensated within a year or two, and the silo will be good for several generations. Surface silos could be built of planks, timber, stone, brick, or galvanized iron; but where possible, the cemented pit silo, or one built in the side of a hill, will prove to be the most satisfactory.

Those who grow sorghums and allied fodder plants should be careful to select the largest and best heads now to provide seed for next season. By doing this regularly every year they will ensure heavy yields of seed and fodder. This class of plants is particularly liable to become cross-fertilised and to dwindle, unless kept up by continued selection of true representatives for seed-bearing. All kinds of maize, millet, sorghums, imphee, &c., must be selected in this way.

Plants can be suffocated by compressing the soil about the roots, or by saturating the soil with water, and thus preventing access of air. By pulverising the surface 2in. to 3in. deep, and maintaining that condition, air is admitted, absorption of moisture from the air is promoted, and escape of moisture from the subsoil is arrested. Nitrogen is one of the principal constituents of air, is the most necessary requisite of plant life, the most costly fertiliser to purchase, and the most readily abstracted from the soil. Legumes and other plants have the power to abstract nitrogen from the air; but, if the soil is compact or soddened with water, neither legumes nor any other plants can thrive.

When fruit trees are to be planted it is good practice to plant alternate rows of different varieties of the same fruit, because the pollen of one variety is often wanted to fructify or fertilise the flowers of another. Thus, if a block of Brandis almonds alone were planted, there would be poor crops of nuts; but if some hardshells and other varieties were grown alongside, there would be heavy crops of almonds. If several acres of Stone Pippin apples alone were planted, there would probably be no fruit; but there would be heavy crops if two or three other sorts were planted in alternate rows with them.

ORCHARD NOTES FOR APRIL.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

At the time of writing these notes the weather continues dry and cool. This is a somewhat deceptive period, and one is apt to forget how dry the soil becomes. In the growing of citrus trees great care must be exercised now to prevent them suffering, and possibly shedding some fruits. To avert this the moisture in the ground should be tested, and if any doubt exists in the mind of the grower it is better to err on the side of applying than withholding a good soaking of water. The best test is to take a spade and open out small holes, say a foot deep, in various parts of the plantation.

Citrus trees are making a second growth now, and rampant water-shoots or any tangled shoots may be rubbed or cut out, if time permits.

If the orange or lemon trees are attacked by scale insects the present is a good time to administer a check to such pests. Spraying with resin and soda wash, or kerosene emulsion, are most effective in autumn. Where the fruits are spotted with red scale a resin spraying now will give the grower practically clean fruit by the time the oranges are ready to gather. A good recipe is 10lbs. each of washing soda and resin, and 5lbs. of soap, to each 50galls. of water. Send to Agricultural Bureau Office for leaflet describing methods of making spray compounds.

Citrus trees may be lifted and transplanted now, but, as far as I can observe, early spring planting is more desirable in South Australia.

The harvesting of late pears, apples, and peaches will be completed pretty well during this month. In those districts where codlin moth is general in the orchards the need for suitable storehouses becomes more apparent each season. A house affording as little shelter as possible for the caterpillars, and at the same time adjusted so that it can be closed absolutely moth-tight, are the chief considerations. The latter is certainly of greater importance than the former.

Some growers adopt the practice of picking the apples into cases beneath the trees, and after they have stood there a fortnight sorting them over again. This method permits of the detection of many infested specimens, which, in the hurry of harvesting, would be otherwise overlooked. The keeping qualities of the sound fruits, bar accidents, are benefited by the practice, as the detection and removal of slightly bruised specimens is also possible. The slight toughening of the skins of the sound fruits is also likely to prove of value in future handlings.

The fruit when stored should be kept in the dark, and only sufficient ventilation admitted to carry away or dry up moisture thrown off the fruit. A draughty shed causes a too rapid evaporation of moisture from the skins, and results in shrivelled tasteless fruit. Apples keep well piled a foot or more deep if properly sorted prior to storing. Pears are much more delicate and susceptible to damage from pressure than apples, and should not be piled in the same manner. It is true a few of the hardy kinds may keep several months under such treatment, but, speaking broadly, pears should stand on their calyx ends in single layers if their longest keeping qualities are to be proved.

Reverting to the codlin moth pest, the bandages should not be removed or neglected immediately after the fruit is harvested. In harvesting, the easily recognised moth-infested specimens should be piled around the tree stems. If the stems are bandaged, and no splits or old bark remains to harbor the caterpillars, a big catch will be taken from beneath the bands around such trees. Some growers, with good intentions, cart them in and pile them near piggeries or cow byres, to be used up as rapidly as possible. This results in the escape of many caterpillars to the sheltering crevices of these structures, from whence they emerge in due season as moths, to infect more fruit.

Ground which has been broken for planting this year should be worked down as soon as a good soaking rain falls. Intending planters should place their orders for young trees with nurserymen at once, otherwise approved sorts may not be available. Practice has proved that in most parts of South Australia autumn planting of deciduous trees produces the best results. If set out while the soil is fairly warm the old roots send out young ones, and practically establish the transplanted tree before the cold of winter chills the soil and stops all vegetative action.

As soon as the harvest is completed and rain falls the soil should, where practicable, be ploughed up roughly. If humus is lacking, and stable manure not procurable, then is the time to sow field peas, or some crop, to be turned in later as a green manure. This early opening of the trodden soil sweetens it and admits the easy and deep penetration of moisture into the subsoil. In some of our mountainous districts after the rain fairly sets in, the soil cannot be worked until the spring season arrives. It may be urged that it is useless to work the surface so early, as weeds will grow only the faster, but I like to see a good growth of weeds during the winter, providing they are ploughed or dug under before they pump the moisture out of the soil faster than the rains replace it.

Those growers who raise their own trees will do well to look to the tied sections around recently inserted buds. If the union is complete the strings should be removed altogether, but not otherwise. If this is not done constriction of the bound portion, and the subsequent choking of the bud, will ensue. The top of the stock of deciduous trees should not be reduced in any way at present, but citrus buds may be started if early frosts are rare in the locality.

Stones or seeds for stock-raising purposes should be sown as soon as possible now, to ensure a good germination this winter.

Owing to the abundance of grapes this season many growers have resorted to raisin-drying for domestic purposes. The weather has not been favorable to this work, and the heavy dews have rendered it necessary to cover the fruit very carefully at night. Those having any structure which can be turned into a drying kiln would do well to utilise it and finish off all fruit as soon as possible.

All kinds of dried fruits should be secured in close boxes or bins, to avoid as far as possible the damage caused by caterpillars of various fruit moths.

SOME NOTES ON PEARS FOR EXPORT.

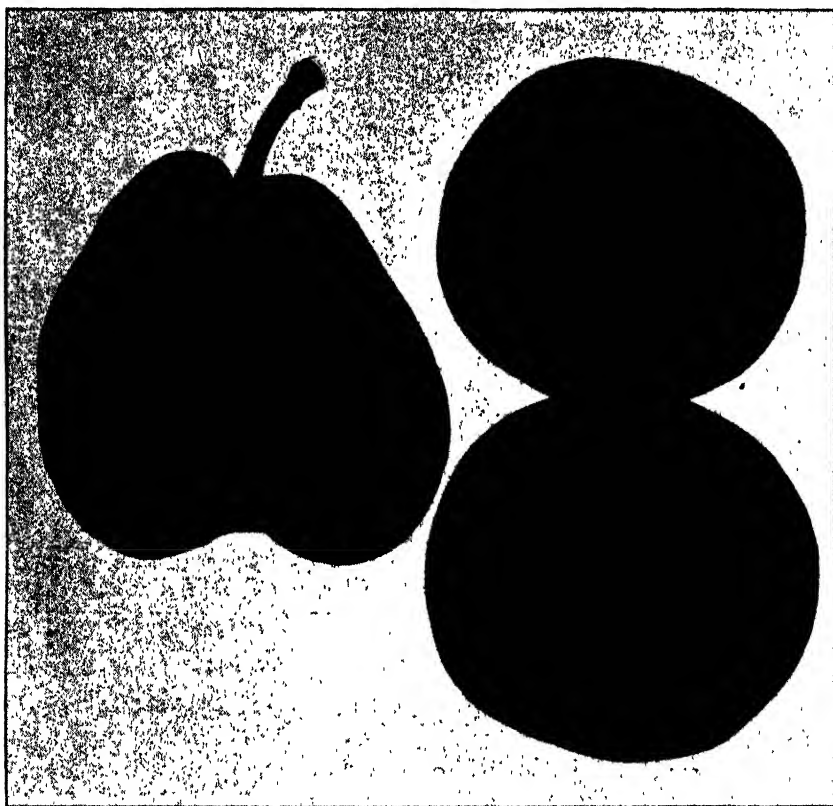
BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

In the following pages I have figured half a dozen pears which are grown to great perfection in this State. Hitherto nearly all our attempts to export pears to Europe in a commercial way have been either wholly or partly disappointing.

In the first place, I believe they will never stand the voyage when packed in the ordinary case used for apple exporting; secondly, they will not carry when packed in a similar manner to that found efficient in the apple trade. Pears bruise with their own weight; consequently they cannot be expected to bear the weight of several other pears pressing upon them. A case holding two layers of small or only one of large fruits is adopted by the French and Californian suppliers of the British markets. Our present export case would, I think, answer if sawn in two lengthways. If so, this would facilitate shipping measurements and stowage on board.

Great care is necessary, not only in selecting the varieties, but in taking them at a proper stage of maturity. This latter is yet a subject for careful

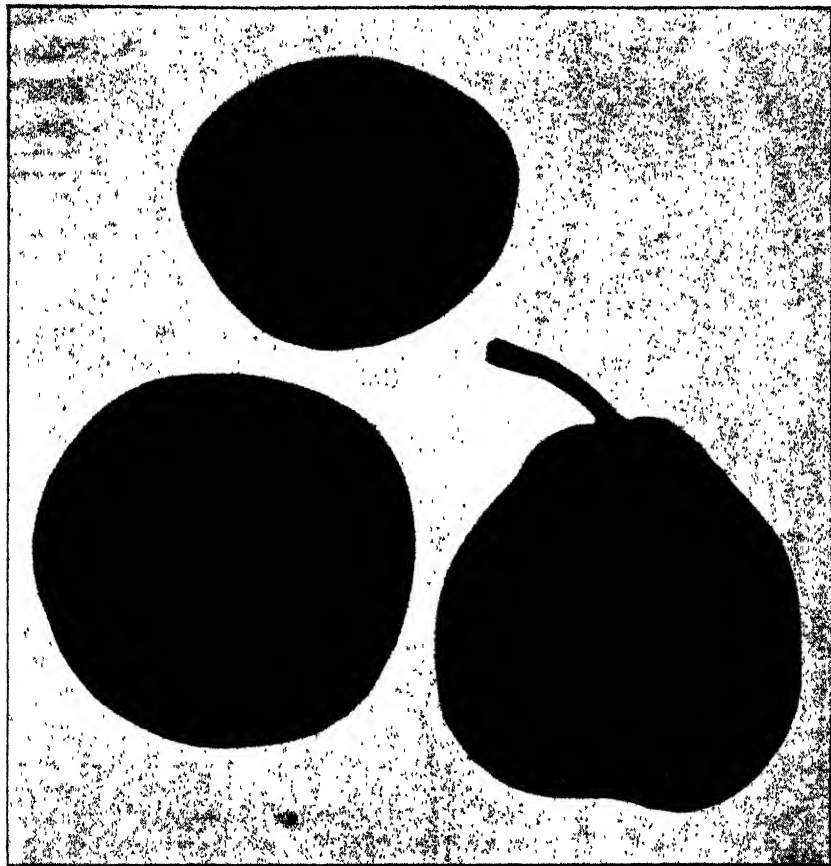
experiment. Skilful wrapping and packing are essentials to success. I believe the fruits should be carefully padded from each other by means of wood-wool. The maintenance of an even temperature on shipboard seems to be more easily accomplished than formerly. Scientific men are also turning their attention to the problem of oversea carriage of fruit, and the rapid advance of general trade in refrigerated products is causing all the intelligence and ingenuity of the engineer to be directed to the subject. The climate of South Australia seems particularly adapted to producing pears of the highest excellence, and there is no reason for thinking the task of placing them in European markets outside the range of early realisation.



FRUIT OF JOSEPHINE DE MALINES, IN SECTIONS, SHOWING GENERAL CHARACTERISTICS.

Josephine de Malines.—This is considered by many of our growers to be the best flavored of all late pears. The tree is somewhat straggling and dwarf in its growth, its bearing habit varying from fair to heavy. The foliage is distinctly pale green, smooth, and shiny. To obtain the best results this variety should be planted in rich soil, and the vigor of the tree may be considerably increased by grafting upon a strong stock such as that provided by a tree of Uvedale's St. Germain, or Vicar of Winkfield, five or six years old. The

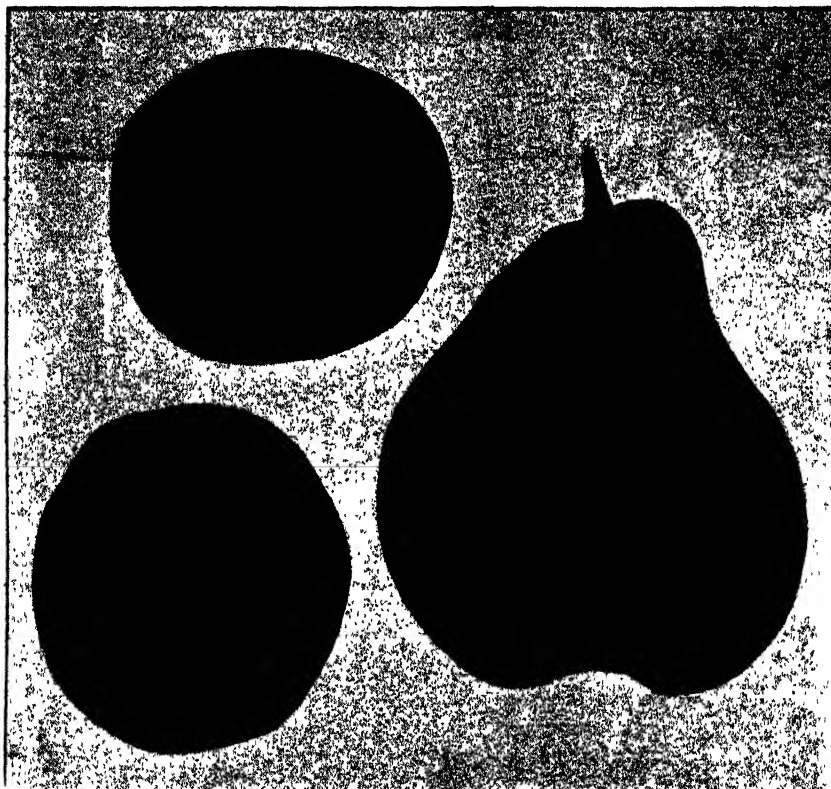
average fruit measures $3\frac{1}{2}$ in. by $3\frac{1}{2}$ in., and may be called a fair-sized pear. The skin is pale yellowish-green, rarely being tinted with red on the sunny side. The eye is fairly open and is set in a shallow cavity. The stalk is nearly an inch long and points away obliquely from its base, which sometimes rests in a slight depression. The flesh is yellowish, sometimes showing a faint pink tinge. When properly ripened it is juicy, and combines its acid and sweet qualities in such a manner as to produce a flavor of the highest quality.



FRUIT OF WINTER NELIS, IN SECTIONS, SHOWING GENERAL CHARACTERISTICS.

Winter Nelis.—This is a thriving variety, but has been largely discounted by a somewhat shy bearing habit. It produces an immense thicket of spurs, and blooms profusely when allowed to grow unthinned, but only occasionally bears a crop of fruit in keeping with its floral promise. The leaves are small, dark-green in color, and supplied with long petioles. In rich or moist situations the tree will grow to an immense size. The fruits are usually below medium size, and average specimens measure $2\frac{3}{4}$ in. by $2\frac{1}{2}$ in. The shape is roundish ovate “dumpy,” narrowing abruptly to the stalk. The ground color, when growing,

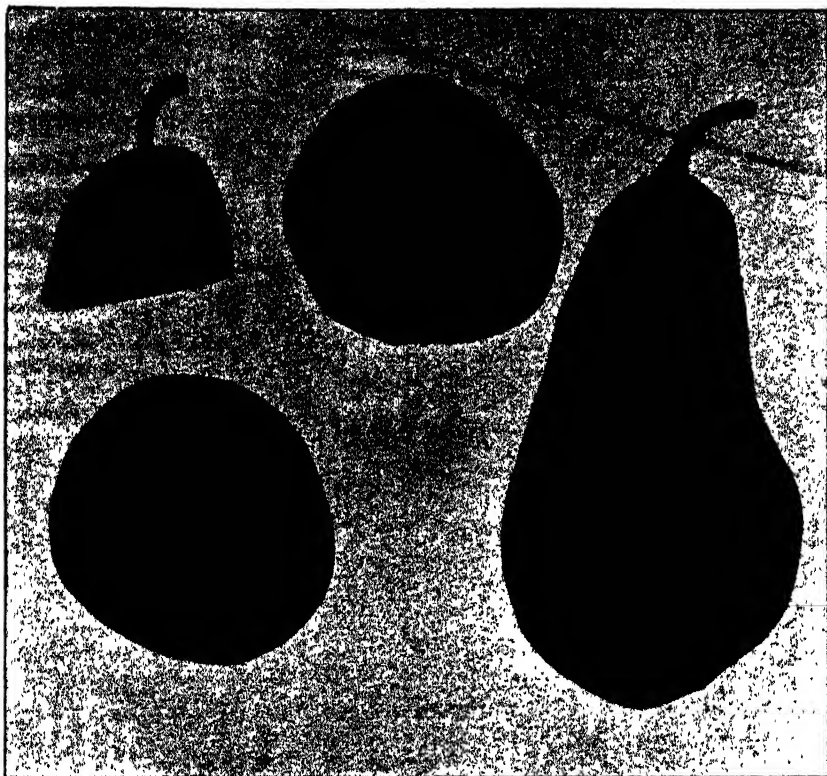
is pale green, but it is almost obscured by dots and blotches of very dark russet. When ripe the skin turns yellow and the russet pales into an attractive cinnamon tint. The eye is open, the calyx segments erect, and the depression shallow. The stalk is long, sometimes reaching $1\frac{1}{2}$ in., and rests in a shallow basin. The stalk is usually twisted and pointing obliquely from its base. The flavor of the pale yellow flesh is rich and pleasantly sweet, giving off at the same time a fine aroma.



FRUIT OF GLOU MORCEAU, IN SECTIONS, SHOWING GENERAL CHARACTERISTICS.

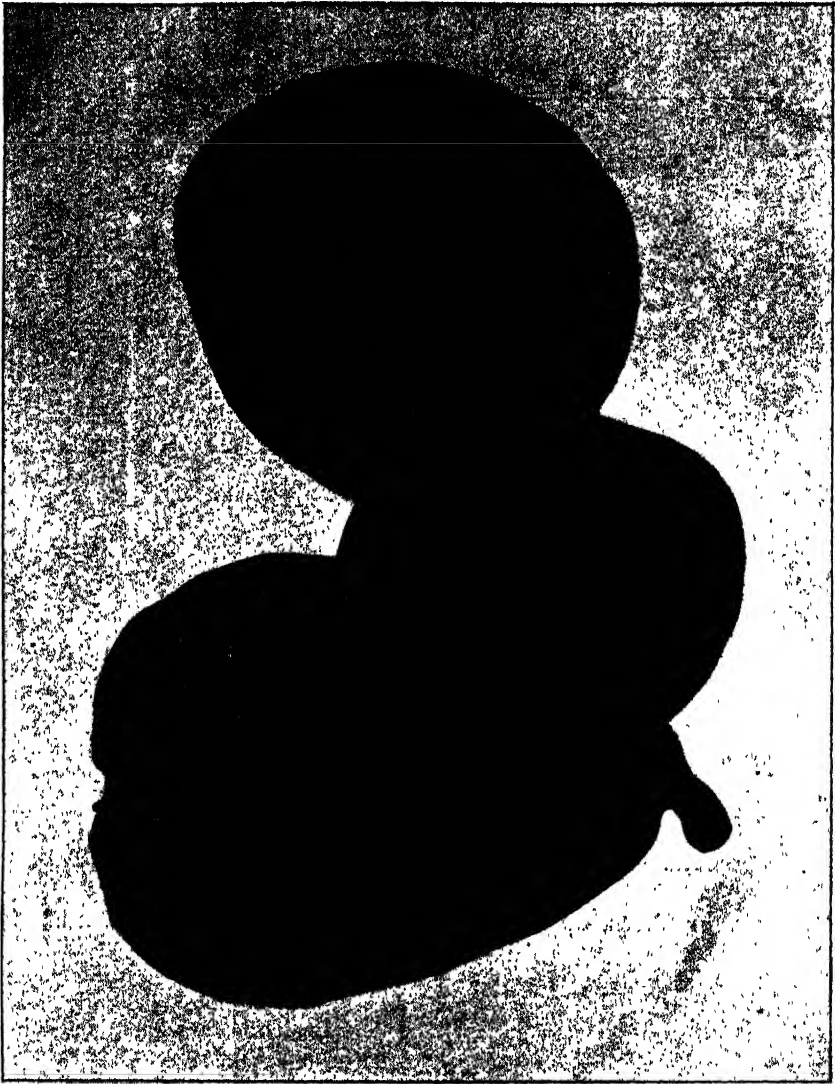
GloU Morceau.—This is the pear known in the local market as “late Duchess.” This tree has a fairly thriving habit of growth, and bears regularly in most localities, but requires pretty rich soil. The foliage is deep green in color, and shiny. The outer dry bark of the tree has a peculiar habit of chipping off in small pieces. It is rather subject to attacks of *Fusicladium pyrinum* (scab). The fruits are pale green when growing, and, if free of the above disease, peculiarly smooth to the touch. It is above medium size, a fair specimen measuring $3\frac{1}{4}$ in. by $3\frac{1}{4}$ in. The general contour of the fruit is irregular, giving it the appearance of having been pressed out of shape. The eye is open, the segments flat and long, the basin somewhat deep. The stalk is fairly long, sometimes reaching $1\frac{1}{2}$ in., and is set in a shallow depression, its stiffness often causing damage in packing. The flesh is beautifully white,

smooth, rich, sweet, and melting, and, on the whole, possesses a first-class flavor. This variety should not be planted on dry soils without water is available for irrigation.



FRUIT OF VICAR OF WINKFIELD, IN SECTIONS, SHOWING GENERAL CHARACTERISTICS.

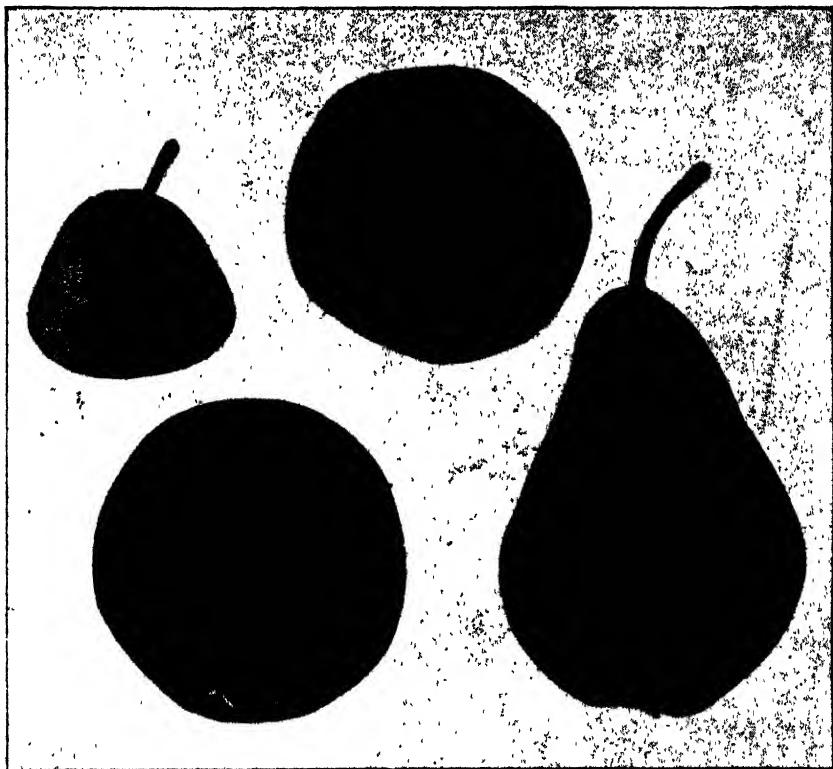
Vicar of Winkfield.—This variety is often called “Napoleon” locally. The tree is a strong upright grower, and the foliage, which is dark green and shiny, is peculiarly free from the attacks of the pear mite (*Phytoptus pyri*). It is a regular and heavy bearer; consequently it should not be planted largely unless exclusively for outside markets. The fruit is large, averaging $4\frac{1}{2}$ in. long by $2\frac{1}{4}$ in. through the bole when thriving trees carry fair crops; the shape is an elongated pyriform, frequently one-sided; the skin is smooth, pale green, with occasional dots of russet, and the sunny side is often tinted with red. A narrow single band of russet often runs the full length of the fruit. The eye is a fair size and invariably open, the calyx leaf segments spreading back. It is set in a very shallow basin. The stalk is fairly long—about an inch—is slender, inserted obliquely on the apex of the fruit and often attached to a fleshy swelling. The flesh is white, juicy, and sweet. It cannot be called a first-class dessert pear, but is a good stewing fruit, and excellent for domestic canning when properly ripened. Its carrying qualities, however, compensate to a great degree for what it lacks in flavor.



FRUIT OF BEURRE CLAIRGEAU, IN SECTIONS, SHOWING GENERAL CHARACTERISTICS.

Beurre Clairgeau.—This is a healthy tree, making stiff, short growths, as a rule. In its earlier years of fruitage the pears are abnormally large, and frequently fall under the influence of strong winds. This is the chief defect attributable to this pear, but as the tree grows older and larger crops are produced the sample is smaller, and this defect is less prevalent; besides the smaller fruits are more serviceable, and will keep longer. Measurements of average fruits show $5\frac{1}{2}$ in. in length and 3 in. through the bell of the pear, being,

therefore, above medium size. The fruit is irregularly pyriform in shape, and very handsome. The skin is of a pale lemon color, with a blush of orange red on the sunny side, and covered with dots and patches of russet, but is, however, smooth and shines like glass. The eye is scarcely sunken at all, and is small and open. The stalk is short, sometimes reaching $\frac{3}{4}$ in. in length. It is thick and fleshy, and usually is swollen on one side and thick at the point of attachment to the spur of the tree. The flesh is white, somewhat gritty grained, but the juice is rich and the general flavor excellent. Unless properly ripened this pear is coarse and turnip-like in texture; consequently its reputation often suffers owing to being marketed before the full flavor has developed.



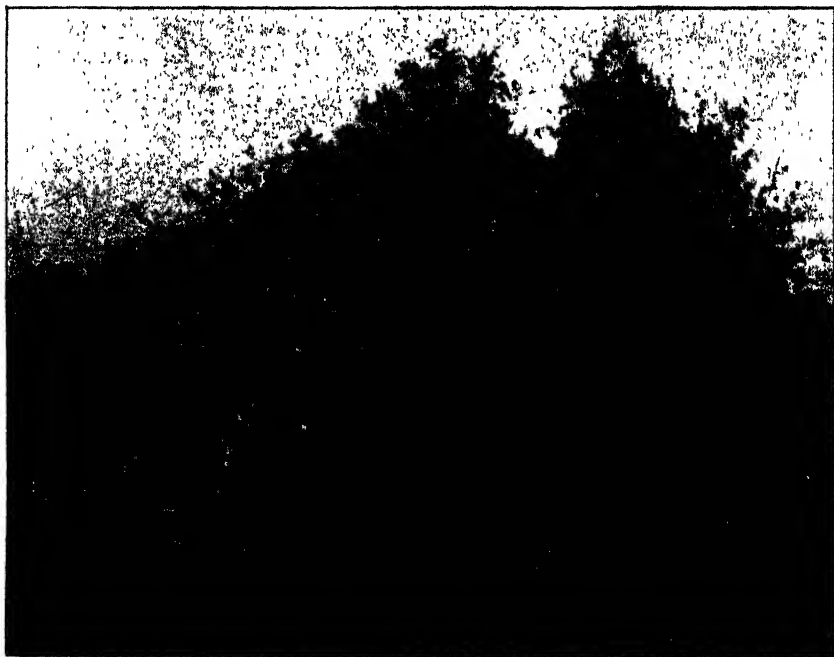
FRUIT OF L'INCONNUE, IN SECTIONS, SHOWING GENERAL CHARACTERISTICS.

L'Inconnue.—This is a moderately strong grower and comes quickly into bearing. The fruit is of medium size and regular pyriform shape. The average size is about $3\frac{1}{2}$ in. by $2\frac{1}{4}$ in. The skin is smooth and pale green in color. The eye is set in a moderately deep basin, and is open, the segments being laid back. Stalk usually an inch long, slender, and set on the apex of the fruit. When ripe the skin is pale yellow, the flesh yellowish-white, very juicy and rich. This is an excellent pear for shipping purposes and not too large for packing safely.

WIRE-NETTING SUPPORTS FOR PEAS.

By GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

Many small growers of peas are quite unable to provide brushwood stakes to support the plant. Our illustration shows how a few stakes and a cheap roll of wire netting may be utilised for the purpose. The large meshed and cheapest netting answers the purpose. The seeds are sown in parallel rows, about 8 in. apart. When the plants are about 6 in. high the stakes are driven in at intervals of 4 ft. or 5 ft. apart down the centre between the parallel rows, and the netting attached vertically to the stakes by threading them through three meshes—one



SHOWING PEAS TRAINED ON WIRE NETTING.

at each margin and another in the centre. The young plants, where necessary, are turned against the bottom of the netting by means of small twigs or anything of the kind to hand. The tendrils soon grip the netting, and the plants require no further attention. They climb on each side, and, as the photograph shows, the pods stand out in the light. The flowers, being well exposed, appear to set pods freely. The gathering of the pods is very rapidly performed. When the plants are finished the haulms are torn off, the stakes lifted, and the netting rolled up upon them and put away for future use. The netting should be from 2 ft. to 3 ft. wide. I have used this method, with netting 2 ft. wide, for several years, and find the results very satisfactory. One great advantage of this method is the saving of time. The netting can be put up in less than one-tenth the time it would take to erect stakes or brush; the same applies to its removal. The netting also affords less harbor for insects and the plants generally are healthier.

NOTES ON VEGETABLE-GROWING FOR APRIL.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

This is a very busy month for the vegetable grower upon the plains. Young plants of the cabbage family set out some weeks ago are thriving, and appear to be keeping comparatively free of aphides and caterpillars. These two pests frequently prove a great drawback to the successful production of early crops of cabbage, cauliflower, &c. Such early crops usually prove the most profitable when secured, consequently it is worth while trying to preserve them as far as possible from such vermin. A certain amount of immunity is attained by dipping the young plants in a solution of tobacco and soap—say 3ozs. of each, boiled in a gallon of water—prior to setting them out. They should be thoroughly wetted throughout to secure the best results.

These pests appear to infest all closely allied plants—stocks and wallflowers are attacked by the green larvæ of the *Plutella*, or cabbage moth—consequently no old specimens should be kept over the summer as hosts for this pest to subsist upon.

All kinds of cabbage, cauliflower, broccoli, kohlrabi, lettuce, celery, and Brussels sprouts may be planted now. If no rain has fallen it is a good plan to thoroughly soak the ground several days before planting, to get it moist, but yet workable. It often happens when a bundle of young plants is purchased or lifted from the seed bed, the soil is shaken from their roots, and the dry air has gained admission to them. A good plan under such circumstances—and, in fact, under any other during the continuance of dry weather—is to puddle the young plants into their positions. This operation is somewhat tedious, but yields more satisfactory results in the long run than watering after the plants are set. It consists of carrying a pot of water, and, after making a hole with dibber or trowel, fill or partly fill it with water, insert the roots of the plant at once, and work the ordinary soil into the water around the roots. This effectually excludes the dry air, and no further watering is needed.

The setting out of early onion plants can also be undertaken. The largest growers of onions in this State sow the seeds in drills in their paddocks, and simply thin out clumps or fill in blanks, as may be required, from time to time.

Growing crops of turnip, swede, carrot, parsnip, beet, and spinach will require careful thinning out when the rough leaves are developed. The root crops not only require sufficient space to develop their fleshy roots but to allow a proper growth of leaves. Successional sowings should be made of the above-named sorts. Early peas require staking to obtain the maximum quantity of pods. Small growers would not go far wrong in using wire netting supports, as described in a separate article in this number. Nearly all growing crops will be stimulated by a dressing of quickly soluble manure, such as sulphate of ammonia or superphosphate. The former does not benefit peas or beans very much, but a light sprinkling of the latter will help them. It is not much use sowing peas now on the plains, as the cold of winter, coming upon their blooming season, usually destroys them or renders the crop unprofitable.

In localities seldom visited by frosts potatoes may be planted still. The sets should be well started, however, so that growth may not be delayed at the outset. If stable manure be used it should be mixed thoroughly with the soil. Bonedust is favored for potatoes, and this may be sown along the trenches after the sets are put in. A little earth should intervene between the tubers and the bonedust,

Sowings of parsley, radish, and cress will be made in small patches to meet ordinary requirements.

Where irrigation is practised it will be necessary to stir the soil with a hoe or fork between the crops, just as often as time permits. If not done after each watering the majority of our soils become compacted, and deteriorate in physical character.

The harvesting of summer vegetables will be brought to a close soon. All kinds of marrows, pumpkins, trombones, and pie melons will require attention. These should be collected and stored as far as possible under cover. Choice specimens of cucumbers, melons, tomatoes, &c., should be reserved for seed purposes. If an extra good sample of dwarf or runner beans is available, pods may be secured for seeds; although with these plants a change of seed is nearly always desirable.

The top-dressing of rhubarb or asparagus beds with decomposed stable manure may be undertaken, though no haste is necessary. The ripening seeds of asparagus plants are troublesome, and, as far as practicable, should be removed before they fall from the stems. Slugs and snails in some places will become very troublesome after the first rains. The former are kept down most thoroughly by dusting the growing plants nightly with powdered quicklime. This should be continued for about eight or ten days, to work them down to a minimum. Snails are generally kept in check by hand-picking after showers cause them to travel out of their places of shelter. Edgings and rubbish which shelter them should be avoided, as "prevention," in this case, "is better than cure."

USE OF THE APPLE.

No fruit known to the cultivator in the north temperate zone can take the place of the apple as a food product. Many other fruits rank as luxuries, but the apple is one of the leading staple products of the farms of the United States.

Because of its varieties its season of maturity extends throughout the year. No other fruit may be had in continuous succession without artificial means of preservation. It is pre-eminently useful in the household economy. As a culinary fruit it is unequalled. It graces the table in a great variety of forms, and as a dessert it has no equal or superior. Its juice when extracted makes an excellent and wholesome beverage, and for vinegar it has no rival. As a market fruit it is the easiest and least expensive to handle, and finds a ready sale if grown and handled with that end in view.

Among the many ways in which the apple is now used the manufacture of jellies and preserves is one of the greatest importance. The numerous factories for the manufacture of these goods which have sprung up all over the apple-growing region of the country have not only created a demand for second and third grade apples, but also for the waste products—cores and skins—resulting from drying and evaporating the fruit.

Jellies made from apple waste are as good as those manufactured from whole fruit. These waste products have not only a value for the uses above mentioned, but there is a growing demand for them for export purposes for the manufacture of cheap wines and cider.

Chops, for which there is also ready sale for export purposes, are made from the lower-grade apples by chopping the whole fruit into coarse pieces and converting by an evaporator into what is known as chops. Apple butter of the real, rich, old-time farm product, not the thin factory-made excuse, fills an important place in the household economy and always finds a ready sale at good prices.

Sweet cider made from sound apples, not from half-decayed, wormy fruit, is one of the most healthful products of the orchard, and all surplus over and

above what is needed for home consumption is always in demand at remunerative prices. It can be kept sweet and unfermented by heating it to a temperature of 160° F. and holding it there for thirty minutes, then sealing it up tight in bottles or casks, to be put into a cool place.

Boiled cider made in the good old-fashioned way by reducing to one-fifth by boiling, and canned, makes an excellent article for culinary purposes, for making apple butter, apple sauce, or for use in apple or mince pies. It also has a commercial value.

While the aim and purpose of the farmer should be to supply an abundance of fruit for his own family, he should also be able to offer to the outside world a liberal surplus. The apple orchard will often bring better returns for outlay than any other portion of the farm, acre for acre. The product of a single tree will sometimes sell for \$10 or more, and fifty such trees can be grown on an acre of land. Though we may not always count on such large results, we may safely expect the orchard to do its full duty one year with another, especially if we first do our duty with it.—*American Cider and Vinegar Maker.*

FARM HINTS FOR APRIL.

BY THE EDITOR.

It is not too late, even now, to sow 2lbs. of white mustard and 3lbs. Early Essex rape on some of the stubble lands intended to be left for grazing purposes. Scarify the seed in, and there will soon be a lot of green feed for the stock. If a little super. and sulphate of ammonia can be applied, the manure will help to make the crop more luxuriant.

For permanent pasturage, in cool localities, various grasses, clovers, &c., should now be sown. These should be mixed, unless it is intended to grow for seed as well as for fodder.

All cereal crops should be sown by the end of May—the earlier the better. The late-maturing varieties should be sown first, and the early-maturing sorts last. It is desirable to have the wheat plants in flower late enough to escape late frosts, and early enough to avoid hot winds.

When there is a possibility of the land becoming boggy during sowing time, it is strongly advisable to adopt the practice of drilling in superphosphate before sowing the seed—say, early in April. This will also help to clean the land. Then sow the seed, either broadcast or with drill—the latter being preferable. The work for the horses will thus be considerably lightened. A caked surface prevents access of air into the soil, but facilitates escape of moisture. Air is essential to the proper action of the roots of plants. For these reasons, and others, it is profitable to use light harrows on the crops whilst they are growing, and so long as the harrows can be used.

Where the land is covered with rough clods, stones, and uneven surface, there must be much loss in mowing for hay or reaping for straw. Therefore the clods should be crushed and the land levelled. Straw must ultimately receive attention as a valuable adjunct in the feeding of stock, and in the economical management of the farm.

Lucern should be grown wherever there is a possible chance of success, and small trial plots should be made with a view to extension should the possibility be thus proved. Break the land deeply and to a fine tilth; level it as far as possible; pulverise the surface; sow the seed with a drill, using 10lbs. of seed per acre; rills 10in. apart; roll at once after sowing. When the plants are 4in. high, use the horse hoe to loosen the surface. If a drill cannot be

obtained, sow 16lbs. to 20lbs. seed broadcast; other treatment as before stated. Where early frosts occur, the sowing should be deferred until October, but in mild localities sow during April, so that the plants shall become established before the cold weather comes on.

There have been many plants introduced by the Central Bureau which have been proved by the Branches to be of value, and yet no one has taken them up and grown them regularly. Broadleaf mustard and Sulla (*Hedysarum coronarium*) were both shown to be really valuable fodder plants, and saintfoin and goat's rue did well in some localities, yet not a quarter-acre of either is probably to be found in the whole of the State. Sand lucern (*Medicago media*) is almost exactly like the common lucern (*Medicago sativa*), but will grow in dryer country. It is a pity that we have so limited a number of fodder plants in cultivation. Many of our sandhills could be used for growing such plants.

Will it pay any farmer to grow seeds of various fodder plants for sale? In the Eastern States there are several who grow peas, beans, mangolds, beets, lucern, maize, prairie grass, rye grasses, and a multitude of other plants for the sake of the seeds, which are sold to seed merchants in all the States as well as abroad. A considerable sum of money goes away every year from South Australia to pay for seeds which could probably be produced here, and of equally good quality.

Now is the time to sow a mixture of oats, barley, wheat, rape, peas, vetches (any three or four of them), to be cut at the proper time for ensilage. Put in a good lot of farmyard manure, and do not forget to add some super., or a good lot of bonedust.

Cow cabbage, all sorts of kails, kohlrabi, and swedes should be planted now. Too much farmyard manure can hardly be given for these crops. The plants must be put in sufficiently wide to allow of air and light getting in sufficiently.

Dirty land should be used for growing crops that require plenty of hoeing. If those crops can be manured all the better. Leaf crops, such as just named, are suitable; or peas or beans will clean and enrich the soil, but should be fertilised with plenty of bonedust. Sunflowers, mangolds, or beets make good cleaning crops, and will pay if thoroughly cultivated.

Horses will require all their strength and activity during the next two months. Feed little and often with crushed oats, grain of any kind, beans, or barley, with a moderate allowance of good chaff.

Bunt (often miscalled "smut") is produced from a spore which is too small to be seen, except with aid of a microscope. The spore is hidden on the grain of wheat, &c. When it comes in contact with moisture it commences to grow, and, if the grain of wheat is soft enough, it enters, and continues to grow until the wheat ear is produced. If the grain is too hard and dry the bunt dies of starvation. Solution of 2ozs. of sulphate of copper (bluestone) in each gallon of water will kill the spores of bunt; but the balls of bunt remain unaffected by the pickle.

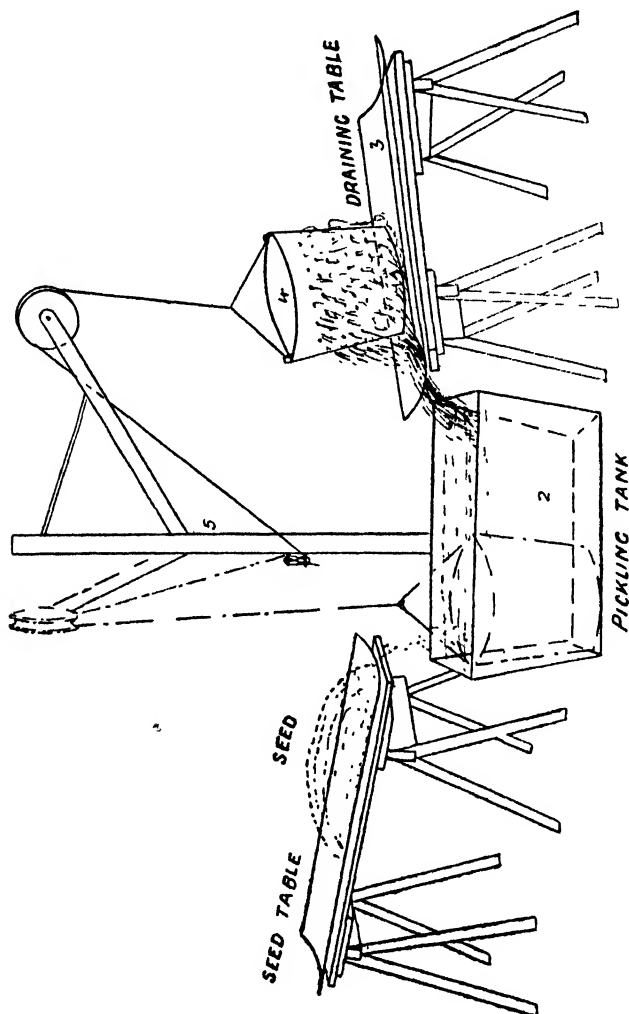
If there are any unbroken bunt balls amongst the seed wheat, there is possibility of their being smashed by the drill or by the seed-sower, and millions of spores may be mixed with the seed wheat, and may become attached to the machine, and become loosened from time to time whilst it is at work. The effective way is to drop the seed into the pickle, and skim off the floating bunt balls and light seed. To do this the plan recommended in March, 1901, *Journal* should be considered.

Provide shelters for live stock of all kinds.

Keep the boars shut up separately until June next. Winter litters seldom pay to raise.

PICKLING SEED WHEAT.

The object in "pickling" seed wheat is to kill the spores of bunt, and possibly of other parasitic fungi. When the spores are protected by a shell, say, in the form of "bunt balls," it is possible that the pickle will not penetrate, and when the seed is sown by drills or by broadcast seedsower those shells or envelopes become broken, and the spores are mixed with the seed wheat, so that it is re-infected. To avoid this contingency, or, at least, to considerably lessen liability to re-infection, the editor recommends adoption of the plan of pickling mentioned by himself last year. The following sketch is a reprint:—



On the trestles to the left is a sheet of galvanized iron curved a little, with the lower end overhanging a trough containing the bluestone pickle. In the trough of pickle is a perforated galvanized or copper tub or basket, into which the seed drops

from the sheet iron into the tub, which has filled with pickle through the perforations. Each grain thus comes into direct contact with the pickle as it sinks to the bottom of the tub. The bunt balls and a good deal of light seed and rubbish will float to the surface, whence they can be removed. The basket or tub can then be lifted by a derrick or other means on to another similar sheet of galvanized iron at the other end of the dipping tank, where it can be left to drain into the tank whilst another tub or basket is being treated. When the pickled wheat has sufficiently drained it can be emptied into bags, where it should remain for two days before being sown. Instead of galvanized iron tubs or baskets the receptacles could be made of strong hessian or of new bran bags affixed to large strong hoops; but these would not last long.

WHEAT FOR TRIAL.

Mr. W. H. Hawke, of Tipara, and a member of Arthurlton Branch of the Agricultural Bureau, has presented half a bushel each of three varieties of wheat for trial by members of other Branches in suitable localities. This would run about 30zs. for each Branch if it were so divided, and if cultivated "for all it is worth" for three years, with similar results obtained by Mr. Hawke, would increase to about 113,000bush. Members receiving parcels of these wheats should sow them in a piece of clean well-prepared ground in the middle of a crop of other wheat, else the birds will probably destroy the plots. If any ears should vary from the general average—such as being bearded or not bearded, as the case may be—the plant bearing such ears should be removed, or, at any rate, the grain should not be mixed with the bulk retained for seed.

The following is Mr. Hawke's description of the varieties:—

Hawke's Club Head.—Fairly early; the best wheat to stand against storms; thrashes pretty well; has a good reputation with neighbors, and by some preferred to Steinwedel.

World's Champion.—A good all-round wheat from Western Australia; medium period in ripening. From twenty-four heads, containing about 2½ozs., sown on July 3rd, 1898, the increase was 40lbs., which, being sown May 29th, 1899, gave 30bush., and that 30bush., sown June 1 and 2, 1900, gave 1,020bush., besides two acres cut for hay. The quantity of seed sown per acre was—First year, equal to less than 10lbs., as it was dibbled in at 14in. x 4in. apart; second year, nearly 23lbs.; third year, 36lbs. per acre. The first seed was sown on garden soil; next two years on field, with about 1cwt. per acre of super. each year. The yields per acre were 17½bush. in 1899, and 21½bush. in 1900; the acreage sown being 50·2 and 48·0 respectively.

Gamma.—A cross between Ward's Prolific and Purple Straw; a grand tillering wheat, has averaged four bags per acre for two years past; handsome grain of bright golden color, and is much admired by wheatbuyers.

ENSILAGE.

A South Australian farmer (Mr. Chas. Rake, of Enfield) was the first man in these States to start a silo, and a few others followed his example. Prominent dairymen in the adjacent States—colonies then—visited South Australia with the object of seeing how silage was made, and they went back and adopted ensilage of fodder with highly profitable results. Ensilage was soon recognised in many parts of Victoria as a necessary factor in successful dairy-farming, silos became numerous, and it was quickly found out that many more cows could be kept upon a given area of land where silage was made than

upon a similar area where dependence was placed upon hay and natural herbage. Where cows or other stock graze upon paddocks, they defile a considerable quantity with their excrements, and tread down and destroy a lot more whilst feeding. Nearly or quite the whole of that waste can be avoided by cultivating nutritious crops and converting the produce into silage. It should not be forgotten that green food is far more easily, completely, and rapidly digested than dry fodder. Exhaustive experiments conducted by scientific analysts have proved that much of the nutriment in dry fodder passes through the animal in the excrement, whilst the nutriment in silage is absorbed by the digestive organs of the live stock to a much greater extent. It has been proved that silage alone is insufficient for the proper nourishment of milking cows; but this defect applies in a much greater degree to hay and dry fodders as a whole; and even when cows have good natural pastures it is beneficial to feed them also with bran, meal, corn, and cake. With chaffed maize silage a number of steers were fattened on a daily ration of 30lbs. silage, 10lbs. chaffed straw, and 2½lbs. copra or other oil cake; but probably a cow would require a little more silage and cake, because she has to supply milk as well as maintain her bodily strength. Where the farmer depends upon hay and natural pastures (except, perhaps, where swamps are available) he dare not stock up to the full capacity of his land; but when he has his silos filled, and his stacks of hay built up, he is justified in keeping a full herd. There is, of course, risk from fire in regard to the stacks, but his silo pits are safe; and whilst he has plenty of silage, and uses it, his cattle will be free from impaction, and will retain their health. A great deal more butter or cheese can be got off an acre of green feed converted into silage than from the same area of green feed made into hay, because the weight of dry hay will be no more than one-third that of silage, whilst the silage will go nearly as far, weight for weight, in feeding the cow. To put it in another way: Four tons of green wheat would make 1 ton of dried hay, 4 tons of green wheat would make 3½ tons of silage. The 1 ton of hay would feed a cow, with addition of cake, grain, meal, &c., for eight weeks, the 3½ tons of silage would feed the cow twenty weeks, with addition of cake, grain, meal, &c. But there would be the further advantage resulting from the partial fermentation and increased digestibility of the silage, that the cow could put through more feed, would produce more, richer, and higher-colored and better-flavored butter than if she had been fed upon dry hay. It may be mentioned, finally, that maize, sorghum, and all other plants will make the best silage if cut when the grain is very nearly fully ripe.

SUPERPHOSPHATE.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

Most farmers, in speaking of the results obtained from the use of mineral super., use the term "English" super. This is due to the fact that during the first few years this fertiliser was used here it was imported from England. This description has continued in use ever since, notwithstanding that for several years past mineral super. has come here from other countries than England, viz., Germany, Belgium, Scotland, America, and New South Wales. Owing to the misuse of the words "English super.," very many farmers appear to hold the impression that there is some special virtue in mineral super. manufactured in England, and object to use any other. As we have one large firm in South Australia already engaged in manufacturing super. from rock phosphates, and another expecting to start shortly, a few words on the subject may not be out of place.

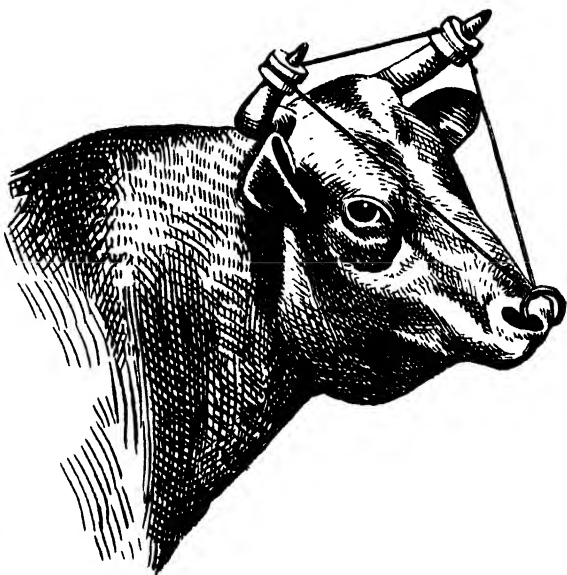
Mineral superphosphate is made by crushing phosphatic limestone, and treating it with sulphuric acid in order to make the phosphoric acid contained in it readily available to plants. The object of the manufacturer is to secure a high percentage of what is called "water soluble phosphate," 36 per cent. being what might be termed the standard in this State, and this is the amount usually guaranteed by the importers. The value of the super. depends entirely upon the amount of phosphate fit for plant food that it contains, and upon its mechanical condition. It is therefore absolutely immaterial where the super. is made. Several dealers have had considerable difficulty in inducing their customers to accept any mineral super. that they would not describe as "English," notwithstanding that its quality—the only thing that need trouble the farmer—is guaranteed. If the dealer adopts the words "English super." as a trade description for mineral super., the fertiliser is accepted without demur, and the favorable returns from its use are of course credited to the special virtues of "English" super. Quite recently an Adelaide firm stated that some mineral super. obtained from New South Wales had been refused by one of their customers because it was not branded as "English" super. As a matter of fact, the sample of this particular parcel taken by the Inspector of Fertilisers as it was being landed on the wharf at Port Adelaide was found, on analysis, to contain 39·7 per cent. of water-soluble phosphate, whereas the firm in question had only guaranteed to supply 36 per cent. super. It was only after some correspondence and a telegram conveying this information that the super. was accepted. Doubtless the results, if good, will be credited to "English" super., and if, owing to the season or other causes, the harvest is not satisfactory the farmer will blame the dealer for supplying an inferior article.

This matter is of considerable importance, not only to importers and manufacturers, but also to the farmers themselves, and it would be well if the trade would drop the term "English super.," and use instead the correct description of "mineral super." The manufacture of superphosphate from phosphatic rocks is likely to attain large proportions in South Australia, and many advantages will result to the State therefrom. It would be a pity to allow a mistaken prejudice to stand in the way of the sale of the home-made fertiliser, so long as the quality is equal to that imported from England or elsewhere. It seems ridiculous to speak of a fertiliser made in Germany as "English" super., yet large quantities have been imported from Germany, and are invariably described by the farmers as such. The same applies to the supers. which have been imported from Scotland, Belgium, and Sydney. The term "imported" super. is used by some firms; but it would be better to keep to the words "mineral super.," as they accurately describe the fertiliser wherever manufactured. That there is no special virtue in English super. compared with that made in other countries, the particulars of returns from the Roseworthy College experimental plots, published in last month's *Journal of Agriculture*, prove. The highest return from any mineral super. was obtained from "Sheep brand" super. made in Germany, the yield being 31bush. 34lbs. per acre. As a matter of fact, America is at present the principal source from which England, Germany, and other countries draw their supplies of mineral phosphates for conversion into mineral superphosphate. As bearing on this point, the American official export records show that Germany imports from America far more crude phosphates for manufacture than does Great Britain. Australia also imports the crude phosphates from America, and is also obtaining supplies from Christmas Island and elsewhere; so that farmers will readily see that it is immaterial where the manufactured article comes from so long as it contains the required percentage of water-soluble phosphate.

TO TAME VICIOUS BULLS.

From time to time reports appear in the press of injury to human life caused by bulls rushing. The Jersey bulls seem particularly liable to develop dangerous temper, though more often than not this is due to mismanagement. Some of the Jersey bulls owned by the department have done injury to their keepers, who, in some instances, admit their own carelessness was largely responsible. In order to prevent the bulls from injuring people, various devices have been adopted, most of them consisting of "head gear" of some description, as this does not interfere with their movements.

The device illustrated here is highly recommended by several breeders. A block of wood is screwed on to each horn and a wire stretched from block to block and also to the nose ring, as shown. So long as there is no pressure on the wires between the ring and the horns the nose ring is simply held upwards without any discomfort to the animal. Should the bull rush any other animal, or attempt to get through any fence, the pressure pulls the nose ring upwards, causing considerable pain. It requires very few experiences to teach the animal that any misbehavior on his part is attended by suffering to himself. One prominent breeder says even the fiercest of bulls is quickly tamed by this device.



In place of the blocks on the horns the latter are sometimes bored through near the point and the wires secured. The blocks may also be put on in different ways, the object being to bring the wires from the horns to the nose away from the head and face.

CONSERVATION OF FORESTS.

BY F. E. H. W. KRICHAUFF.

Mr. James Page has obliged me with the loan of an article in the *Quinzaine Coloniale* of February 10th, 1901, written by Roger Ducamp, as forest inspector, wherein he pleads for the conservation of forests, chiefly to avoid tropical famines, from which the following translation and extracts deserve notice:—

Periodically famine appears in India and demands numberless victims. This is to a great extent ascribed to deforestation, and M. Ducamp foresees in the gradual lowering of the Nile great dangers for Egypt, and says, "If the *pax Britannica* in Egypt is the drying up of the Nile, such a peace is worse than

the plague of anarchy." Lord Rosebery said once, "The Nile is Egypt, and Egypt is the Nile," whose sources are constantly decreasing. One day, as with other rivers of the East, the water will flow only under the surface, and cannot fertilise the lands, in consequence of the destruction of the forests at its sources. Then look at Persia, which has no river, notwithstanding its high mountain chains; also at the contrast, Mesopotamia, which taught the Asiatic world, now shows; at Transcaspia, where it hardly ever rains. The north of Africa was the granary of Rome, of which now a French forester writes that within scarcely forty years there are hardly any remnants of the immense forests of *chêne-zeén* left; the admirable cedars of Batna and Tetifare are now nearly a legend. With the destruction of the forests that of the pasturage will follow. Another forester says, "The forests disappear; the heavy rains can now remove the last of the dead grand cedars into ravines together with the humose soil." Algiers suffers already; the denuded soil becomes hotter, the surcharged hot air mounts in grotesque columns, and it does not seem impossible to show that the hot winds which now visit the valley of the river Rhone and lands over the Mediterranean Sea are modern winds arriving from there.

At present the river Congo is protected by thick forests which condense the rain, and it reminds us of the same conditions that previously assured the full flood of the Nile. At the Congo the aboriginal tools have left little devastation, and it flows probably now as full as on the day man first appeared upon its banks. But now the stone age has passed by; iron tools cut trees for caoutchouc, for timber, and for railways and steamers. Will Belgium protect the forests fairly, or will they be destroyed to realise in a few years this wood—capital—which it will require several centuries to reproduce, if at all?

Prosperity for agriculturists can only be obtained where a proper balance between cultivated land and forests is maintained. When the folly of deforestation commenced in India, leaving only a minimum of necessary forest, the diminution of the rains surprised people. Later on the dry seasons alternated with inundations instead of the former beneficent showers of rain.

The sole remedy is planting and conserving forests if we wish to re-establish periodical rains. Forest culture is one of the important factors of the great social problems. Eminent men have always taken the greatest interest in it, and M. Huc, a missionary priest, wrote so long ago as 1832, the following:—

About the middle of the seventeenth century the Chinese commenced to penetrate into Tartary, which at that time was a magnificent country, the mountains covered with fine forests and the Mongols found plenty of pasturage for their herds. For very moderate prices the Chinamen obtained permission to cultivate, and from that time the land changed gradually its appearance. All trees were destroyed; the forests cut on the summits of the mountains; and the new cultivators soon exhausted the fertility of the land. It is now almost entirely in the hands of Chinamen, and it is their system of devastation which seems to cause the great irregularity of the seasons, and make this unhappy country desolate. Droughts are frequent, almost every year; the winds of the spring dry up the land, and after these storms rain may soon appear; but this is more feared than desired, as it is generally a furious rain-spout; fields and crops disappear under a sea of slush, enormous masses of which flow down the valleys and ruin everything in their passage. Such torrents soon stop; in a few hours the sun reappears, but a great part of the crops with very much of the good soil is swept away. Hailstones of extraordinary size frequently also destroy crops, and these, with drought and inundations, lead to famines from which untold numbers of the inhabitants die. The famine of 1832 was the most terrible of which I have heard; excepting a few vegetables the neighborhood of Tulon-Noor produced absolutely nothing. The rest is a sandy waste, and wells extremely rare, which even dry up in the hot weather.

The future of France itself is now full of promise as regards forests since M. Melard has raised the alarm. M. Guinier, inspector of forests, however, wrote in November, 1900, that there are two classes of persons—one that loves trees and forests and another that considers a forest as an obstacle; and the latter class can also be found in South Australia, where they desire to acquire the

land for their own ends. The care which persons take of their own forests is, so to say, the thermometer of their prosperity and progress, as they do not only enjoy the benefit from the timber their forest produces, but also the indirect advantages—shelter and a regular rainfall. And M. Dumond adds, "Without forests, no water; without this, no crop, no cattle; and rent and taxes cannot be paid." Shall we remain in the background compared with France and Germany?

POULTRY NOTES.

BY D. F. LAURIE.

England's Egg and Poultry Bill.

With the issue of my pamphlet on "Breeding and Rearing Poultry," published by the department in 1895, was a slip from the manager of the export branch giving the following approximate figures for the year 1893:—Poultry and game, £580,000; eggs, £3,675,000, as the egg and poultry bill of England. It is not a case of the United Kingdom, but practically London and the larger cities of England, which consume these vast supplies. Ireland (and Scotland to a less extent) sends large quantities of eggs and poultry, as well as game, to the London and other markets. When lecturing, and since, in my notes, I have ever pointed to the fact that the demand in England was a growing one. These views are borne out by the figures I shall presently quote from the "Trade and Navigation Returns" published for year ending December, 1900. Our own export returns are published in the *Government Gazette*, naturally without comment; extracts are published in the newspapers, but I do not know of one instance in which any allusion has been made to the importance of our egg exports unless I have forwarded a slip to the editors. I can only account for this by the fact that, for some reason (Americans would say from "pure cussedness"), the average South Australian is strongly imbued with the belief that under no circumstances can profits be made from poultry, and that the mildest view we can take is to consider them like one of the plagues of Egypt—to be endured in a meek and lowly state of mind. Whenever I hear people speaking in this strain it is a sure sign that in nine cases out of ten the speaker was born tired, and that his methods are slipshod. Poultry-keeping, like everything else, requires proper attention in housing and feeding, and only profitable birds must be kept. People who let the hens roost on their vehicles and machines (if they are under cover), keep birds years past their profitable age, and starve them or allow them to destroy haystacks, gardens, and crops, cannot be considered authorities on this question. It has never been my aim to coerce all and sundry into poultry keeping, for the good reason that such efforts would be futile, for everyone is not fitted for the work, nor would poultry thrive in all situations and under all conditions. The aim has been of a twofold nature—First, to point out to those who keep poultry that improved methods and breeds would cost no more, but will pay much better; and, secondly, to show the possibilities of this much-neglected industry to those on the look-out for a profitable but light occupation. Our great drawback in many industries is a profitable outlet; growers of fruit, &c., have long felt the pinch of production at low prices. Some jammakers find pumpkins, &c., make a cheaper article than the proper fruit; but, thank goodness, no one has yet made satisfactory artificial eggs. The figures I now quote are conclusive evidence of the presence of a market in which our geographical position enables us to land our eggs and poultry in times of high prices.

The British imports for the two years were :—

	1899.	1900.
Eggs	£5,044,392	£5,406,141
Poultry and game.....	785,294	1,010,337
Totals.....	<u>£5,829,686</u>	<u>£6,416,468</u>

It will be seen that there are increases of £361,741 for eggs and £225,033 for poultry and game in one year. For comparison I also give the figures for an extended period, both for poultry and game and for eggs :—

Eggs.

—	—	Increase or Decrease over Previous Year.	Increase over 1891.
		£	£
1891.....	3,520,918	—	—
1892.....	3,793,018	+ 272,100	272,100
1893.....	3,875,639	+ 82,621	354,731
1894.....	3,786,320	— 89,319	265,402
1895.....	4,003,440	+ 217,120	482,522
1896.....	4,184,567	+ 181,127	463,642
1897.....	4,356,799	+ 172,232	835,881
1898.....	4,457,117	+ 100,318	936,199
1899.....	5,044,392	+ 587,275	1,523,474
1900.....	5,406,141	+ 361,749	1,885,223

Poultry and Game.

—	—	—	—
1891.....	466,979	—	—
1892.....	583,430	+ 126,451	126,551
1893.....	578,959	— 4,471	121,980
1894.....	480,890	— 98,069	23,911
1895.....	605,166	+ 124,276	148,187
1896.....	605,458	+ 292	148,479
1897.....	730,725	+ 125,267	273,746
1898.....	637,492	— 93,233	180,513
1899.....	785,294	+ 147,802	328,315
1900.....	1,010,327	+ 225,033	553,348

The total increase (poultry and eggs) for the year 1900 over the year 1891 is, therefore, £2,481,971. It is beyond question that the increase is due to the great quantity received, quite apart from the demand. Certain years show a slight falling off, due to lighter supplies, not to decreased consumption. The following table is of interest as showing the sources from which the imported eggs are received, with their numbers and values. A great hundred is 120, or 10doz. :—

—	1899.		1900.	
	Great Hundreds.	Value.	Great Hundreds.	Value.
		£		£
Russia	4,318,601	1,183,031	4,024,712	1,109,563
Denmark	2,266,030	808,543	2,438,838	923,551
Germany ..	3,454,986	966,641	3,513,988	1,016,719
Belgium	2,457,588	759,250	2,375,983	733,463
France	2,288,558	867,875	2,276,850	868,133
Canada ..	646,867	233,693	807,702	288,945
Other countries	742,156	225,369	1,443,745	465,787
Totals	16,174,756	£5,044,402	16,881,838	£5,406,141

The total number of eggs imported for the years given are as follows:—1897, 1,683,810,480; 1898, 1,730,952,120; 1899, 1,940,971,200; 1900, 2,025,820,560. The average prices for foreign eggs per great hundred were:—1896, 6s. 3½d; 1897, 6s. 2½d.; 1898, 5s. 10d.; 1899, 6s. 2½d.; 1900, 6s. 5½d.

The prices for eggs from different countries are as follows, and are of interest:—

	1899.		1900.	
	Per Great Hundred.		Per Great Hundred.	
	s.	d.	s.	d.
Russia	5	5½	5	6
Denmark	6	0½	7	6½
Germany	5	7	5	9½
Belgium	6	2	6	2
France	7	7	7	1½
Canada	7	2½	7	1½
Other countries	6	0½	6	5½

Russian eggs are not noted for high quality, and the price shows this. It is most gratifying to see that Canada gains second place for eggs, which evidently travel far by both land and water.

I alluded to co-operation as being largely necessary in the interests of our producers in more ways than one. A thorough scheme would facilitate marketing, grading, packing, and shipping, while certain regulations would insure freshness and clean appearance in the eggs, and age and condition in the poultry. We took many hints on dairying from Denmark; let us follow her in co-operation, at any rate as regards eggs and poultry. A distinct advance is noted in Danish eggs and poultry as regards quality, and that is largely due to co-operation, which, from a small beginning, is extending rapidly. Producers in this State are in a totally different position to what was the case a few years ago. Poultry-breeders a decade ago had little precise information at their disposal, and there was only the Australian market; now we have the English and South African markets in addition, the Export Department, as well as information on rural subjects continually published by the State.

America is a go-ahead country, and is looked to by many as the teacher in all things. The following quotation from the *Farmers' World* respecting the poultry industry in the State of Missouri will be startling to many who do not know that the poultry industry of America stands at the top. The statistics are official:—"Over 70,000,000lbs. of poultry, and almost 56,000,000doz. of eggs, were hauled by the transportation companies last year, the aggregate cash returns for which were 8,229,222 dollars. To more fully realise the importance of this 'infant industry,' compare its achievements with some of the others. The gross value of the Missouri shipment of poultry and eggs in 1898 exceeded the value of the shipments of lumber, logs, crossties, piling, cooperage, and cordwood. Group together this total value of all the shipments of coal, nickel, iron ore, pigiron, tripoli, charcoal, stone, gravel, fireclay, lime and cement, brick, tile, sewer pipe, and stoneware, then add piglead and spelter, and the hen will beat the aggregation and half a million dollars to spare. Here is another comparison: Combine the value of the shipments of corn, castor beans, popcorn, buckwheat, apples, peaches, strawberries, raspberries, blackberries, dried fruit, whisky and wine, cider and vinegar, molasses, fish, game, and feathers, and Missouri's new queen will be several thousand dollars to the good."

The preservation of eggs on a large scale is effected in various ways, the most general being the lime solution, water-glass pickle, and cold storage. The first is going out of date, as eggs so preserved are only fit for cooking, as a rule. The water-glass solution is excellent, and is in very general use. Recently Messrs. W. Thyer & Co., of Waymouth Street, showed me a great many thousand dozens of eggs packed in large galvanized-iron vessels in a solution of water-glass (silicate of soda). Operations have proved most successful, and this method is preferred by the firm to cold storage, being cheaper and more effective. I have before alluded to the inevitable evaporation of the contents of eggs stored in cold chambers unless the pores in the shell are hermetically sealed. This water-glass does. Rotten eggs, which through mistake get into this fluid, turn black, and can be identified at once. Further than this, Messrs. Thyer & Co.'s experience is that there is no danger of the adjoining eggs being affected. The firm has supplied several country clients with water-glass, for the purpose of preserving their eggs. Mr. Thyer agreed thoroughly with my views on co-operation. It appears, then, that all the farmers in a given district have to do is to pay scrupulous attention to the freshness of eggs delivered by them at a central station, where they are immersed in a vessel of this solution. When required for sale or shipment they are taken out, drained till dry, and then carefully packed. The matter is simplicity itself. Guaranteed tested eggs so packed should be looked upon as an asset of a certain cash value, and it is probable that business men with whom the eggs were stored would advance a certain percentage of value, so that those in want of cash would not need to sell when the market was glutted. I sincerely hope a member of each Branch of the Bureau will bring this subject forward, as it is one which will materially add to the returns of the district where it is adopted. There are lots of people who have odd dozens of eggs to spare who would join in a scheme like this, but would not bother to market them in the ordinary way. The testing of eggs is a very simple matter; each could test his own, and a simple rule to that effect would minimise the number of unsound eggs brought in. For domestic purposes a cask of this solution can be filled by degrees with the surplus eggs. Remember that unfertile eggs are more satisfactory than impregnated ones. Unless for the breeding pen, no male birds are required.

EXPORTS OF STAPLE PRODUCTS.

The value of staple produce exported from South Australia last month was £452,381, compared with £413,549 in January, £323,527 in February, 1900, £290,013 in 1899, £143,865 in 1898, £143,399 in 1897, £263,848 in 1896, £188,086 in 1895, and £260,465 in 1894. Thus for the time of year better trade was done last month than for at least seven years. Compared with January the main increases were in wool, wine, flour, eggs, bark, and several items of minor produce. Last year more nearly approached the present in the nature of the season, and consequently in the value of staples exported than any of the others enumerated, unless 1894 be excepted; and it will therefore be interesting to make some comparisons between these years. In 1893-4 the wheat harvest came to over 14,000,000 bush. The nearest approach to this quantity has been secured in the current year when we estimate that 13,000,000 bush. have been gathered. Nevertheless, judged by the first two months of the year, the wheat is being more rapidly moved this season than seven years ago. In January and February, 1894, 1,881,047 bush. of wheat, valued at £234,581, and 9,840 tons of flour, valued £69,786, were exported, whereas for the same period of this year the figures are 13,263 tons of flour, £82,256; 1,947,655 bush. of wheat, £267,832. Then

for the time of year wool was exceptionally largely shipped last month. This of course, is explainable in the light of recent events in the wool market. Owners are evidently becoming more reconciled to the situation, and, encouraged by the improved prospects of better prices, are sending their produce to market more freely than they were disposed to a short time back. Last month 16,871 bales of South Australian clip were exported, the value represented being £157,481. It is when a glance is taken at some other item of export, however, that the advance which has been made of recent years stands out. Notwithstanding the exceptional export of wool last month the proportion which wool, wheat, and flour bore to total exports was less than in 1894, being 68 per cent., compared with 72 per cent. This difference is due not to any diminution in the shipment of our main staples as already shown, but to an increase in what has often been referred to as "minor" products. Seven years ago, for instance, there was no frozen meat industry. Last month, though the end of the season has been reached, 601,227lb. of frozen mutton and lamb, representing £9,813, were shipped from South Australia. To take some other lines, the following items of export in February, 1894 and 1901, will illustrate the same thing:—Bark, 1894, 291 tons, 1901, 1,313 tons; eggs, 1894, £1,767, 1901 £5,572; fresh fruit, 1894, £2,179, 1901, £4,803; dried fruit, 1894, £2, 1901, £338; hay and chaff, 1894, 568 tons, 1901, 1,346 tons; honey, 1894, 5,404lbs., 1901, 10,258lbs.; potatoes, 1894, 1,516cwt., 1901, 1,877cwt.; wine, 1894, 14,804galls., 1901, 36,331galls.; salt, 1894, 380 tons, 1901, 2,259 tons. Preserved meat, jams, and preserves were more extensively sent away this year, owing largely no doubt to the exceptional demand in South Africa. The following gives an idea of how staple exports this year compare with last:—January, 1900, £363,113; January, 1901, £413,549; increase, £50,436, equal to 13 per cent. February, 1900, £323,527; February, 1901, £452,381; increase, £128,854, equal to 39 per cent. Grand total, 1900, £686,640; 1901, £865,930; increase, £179,290, equal to 26 per cent.—*Register*.

GOVERNMENT BUTTER-TESTING.

By G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

In last month's *Journal of Agriculture* it was mentioned that additional experiments would be conducted in the testing of butter, and attention was directed to the necessity for investigating the effects of different temperatures in the refrigeration of the product.

Over two years ago this work was commenced by myself, and the value of the information gained from the experiments has been considerable.

By a continuation of the original plan of investigation the following important practical and scientific tests will be carried out, which will open a further field for research.

A number of boxes of butter will be manufactured, according to instructions given, from well mixed cream, separated in the factory. After manufacture, and immediately before refrigeration, the butter will be tested by points, and also bacteriologically examined. The boxes will be divided into five lots, and each lot chilled at different degrees of temperature. At the close of refrigeration the butter will again be practically and bacteriologically examined.

On similar lines to the above another test will follow, but the cream will be taken from outside supplies. Continuing with the manufacture of a third, fourth, fifth, sixth, and seventh quantity of butter, of which portions will be brined in the churn, dry-salted, preserved without salt, brined and preserved with a preservative, dry-salted and preserved with a preservative.

Chilling the individual lots will follow at four fixed temperatures, and the fifth at varying degrees of cold. Practical and bacteriological examinations will be conducted as in the former test.

Some Results from Past Butter Tests.

1. From the production of plate and tube cultures serious contamination was shown to follow milking with dirty hands and neglect to clean the udder of the cows.

2. When plates were exposed to the air of a dirty milk room, colonies of injurious germs grew abundantly; also moulds of different varieties.

3. Chemical and bacteriological examinations made of water used for washing butter showed that the quality varied from extra good to very low.

4. Cultivations made from sweet milk, cream, and butter produced *oidium lactis* moulds.

5. Bacteriological examinations of sweet, separator, and buttermilk proved that contamination followed the use of dirty separators and churns.

6. Fishiness was found to be very pronounced in butter manufactured in districts where the feed was rank at the date of making. In districts where the feed was well matured only faint indications of fishiness were found.

7. Nearly all the fishy butter was manufactured from cream ripened to a high degree of acidity. Butter made from cream with a low degree of acidity was free from a well-marked fishy flavor.

8. Where colostrum was found in the milk of five factories fishiness was present in the butter.

9. All the best butter was found to be free from fishiness before refrigeration, after refrigeration nine boxes out of a total of seventeen developed fishiness, which varied from very strong down to light flavor.

10. After refrigeration and thawing, fishiness was very distinct in the best brands.

11. Discoloration was not observed in any fishy samples beyond what was noted prior to chilling.

12. The fishy flavor appeared to be of equal strength throughout the body of the affected butter.

13. Butter made out of the same churn, a portion of which was brined and dry-salted, was unaffected with fishiness and kept perfectly, while the other portion that was dry-salted developed a strong fishy flavor.

14. The best keeping butter throughout all the tests was from brined butter grains.

15. Preservatives seemed to check fishiness.

16. Pure cultures of germs made from very fishy butter did not show colonies productive of fishiness up to the present time of writing.

17. Certain moulds were found to flourish in the presence of boracic acid in butter not chilled.

18. A falling and rising temperature in the refrigerator did not encourage an increase in fishiness.

LABEL PASTE FOR TIN OR GLASS.—Take 4ozs. gum arabic and 1oz. gum tragacanth; soak each separately in half a pint of water. When the tragacanth has formed a viscid emulsion, stir in the gum arabic solution, and strain both through a fine linen cloth. Have 4ozs. glycerine, stir in forty drops oil of thyme or oil of cloves, and mix this with the gum solution. Then stir in 1qt. of distilled water. Fill 6oz. bottles with the paste, keep well corked, and use as required. Exposure to air is injurious to the bulk; therefore keep the paste in closed bottles until wanted for use.

IMPORTATION OF PLANTS.

Regulations relating to the Introduction of Trees, Plants, and Fruits into South Australia.

1. In these regulations the following words in inverted commas have the meanings set against them respectively, that is to say:—

“Minister” means the Minister of Education and Agriculture or the Minister for the time being controlling the Department of Education and Agriculture.

“Inspector” means an inspector appointed under “The Vine, Fruit, and Vegetable Protection Act, 1885.”

“Disease” and “Insect” have the meanings respectively assigned to them by section 3 of the said Act.

2. (a) The introduction into South Australia of grape vines and any portions thereof, from any country or place, is absolutely prohibited.

(b) Living trees, plants, or portions thereof (not being grape vines or portions thereof), and fruits (not being grapes) may be introduced into South Australia from any country or place under and subject to these regulations, but not otherwise.

(c) Living trees, plants, and portions thereof (not being fruit) shall (unless sent by post) only be introduced into South Australia at Port Adelaide.

(d) All living trees, plants, or portions thereof, intended for introduction into South Australia must, prior to being landed or introduced, be thoroughly cleansed of soil: Provided always that any inspector may admit plants growing in pots, if in his opinion there is no danger in importing them.

3. All living trees or plants, or portions thereof, or fruits introduced into South Australia from any country or place shall, on being landed or introduced, be forthwith delivered into the custody of some officer of Customs, and shall, at the expense of the importer or consignee thereof, be conveyed in original unopened packages to such place as the Minister shall direct.

4. An inspector shall examine such trees, plants, or portions thereof, or fruits, and may treat such trees, plants, or portions thereof, or fruits, in such manner as he may think desirable, or may order that such trees or plants, or portions thereof, or fruits, and the boxes or packages in which they were packed, or either of them, shall be destroyed by fire if, in his opinion, there is any danger in importing them.

5. The expense of conveying such trees, plants, portions thereof, or fruits to the place fixed for their examination, and of the examination and treatment or destruction thereof, shall be borne by the consignee or introducer thereof, and shall be paid before they are delivered to such consignee or introducer.

6. No person shall be entitled to any compensation by reason of the destruction of any tree, plant, portion thereof, or fruits, or of any box or package under these regulations.

Regulation for Preventing the Spread of Insects and Diseases.

7. No person shall keep or sell, or expose or offer for sale, or in any manner cause the distribution of any living insect of the kind prohibited in any stage of its existence, or any tree, plant, or fruit infested with or affected by any insect or disease.

Penalties.

8. Any person guilty of any breach of the above regulations is liable to a penalty of not less than five pounds nor more than one hundred pounds, or to be imprisoned for any period not exceeding six months.

Repeal.

9. The regulations relating to the introduction of trees, fruits, and plants into South Australia, made by proclamation dated the 21st day of November, 1900, and published in the *Government Gazette* on the 6th day of December, 1900, are hereby repealed.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

April 1, 1901.

Unfortunately another dry month to report, and though at moment light squally showers with half a gale blowing along our coast may indicate the break up of the dry season copious rains will have to fall very soon to be of much use in bringing along vegetation to give feed for the coming winter. Throughout the Hills districts it is now almost too late, as there cold weather has already set in. On the west coast agricultural, and over most of the outside pastoral country, heavy rains have fallen at intervals during the past six weeks, so that feed there is generally abundant, and stock are getting into fine condition. Vignerons have had very favorable weather for gathering their grapes, so that the quality of wine made this year should be excellent, whilst good yields are mostly reported.

Fair business has been doing in town and country, checked only somewhat by the lowering price of wheat, and the fall in value of lead, which threatens to lessen further the activity on the Barrier mines. The Tarcoola field has benefited by the recent rains, so that the testing of their shows by actual crushing is likely to be soon accomplished. The battery of one of the leading companies is nearing completion, whilst a Government plant is also on route for that district.

A sluggish month in the grain trade is almost a repetition of our previous report, but no better term can be used. A slackening in demand in the world's wheat markets, and the necessity for our farmers to prepare for and plant another crop, caused deliveries to ease off, but, there being a fair quantity of stored grain, shippers were enabled to fill their wants, and there is plenty yet at our ports to supply all likely shipping requirements. From Sydney, Melbourne, and Adelaide some 70,000 tons of wheat this season have been sent to the west coast of South America—a new direction for at least any large quantity of our wheat to go. Steady shipments of flour from our ports continue to be made to South Africa; the *Juanita North* took away 500 tons, the *Anglo-Norman* is loading 1,300, and there are several ships about due to load for the same destination. There is no alteration to report in quotations for fodder lines, except that millers' offal is weaker, and that only small local trade has been passing in fodder and feeding grains.

As the season advances it becomes more apparent that the potato crops in this State are digging very light, and in the South-Eastern districts that the quality of the tuber is not nearly up to usual. We will have to rely increasingly on importations, which have already begun, so that future prices must be controlled entirely by the rates ruling in the other producing States. Onions generally are good in quality this season, but crops of these also are turning out lighter, so that values have improved substantially during the past month, and holders are confident of realising satisfactorily.

Rain having held off throughout the dairying districts, there is but little hope now of South Australia being able to supply its own needs in dairy produce for some months to come. The importation of butter and cream has been larger during the past few weeks than at any time for years back, and may be reckoned to continue very heavy. There has been a steady export and good local demand for eggs, which has kept them moving up, so that values are 2d. per dozen higher than when last quoted, and, though quantities coming in from the country are unusually heavy for time of year, demand keeps the market clear. Cheese is scarce, but price being nearly up to a figure that would permit of profitable importation, higher rates are not probable until local stocks are exhausted; the demand for this line, however, will as usual slacken off much as the weather becomes colder. Deliveries of bacon have been hardly sufficient to fill demand, but are increasing, and the supplies of the raw material at the live market makes it likely that values will soon become at least slightly lower. Local cured hams have been scarce. Honey, after showing some activity, again became dull; beeswax has been very saleable. Almond deliveries are increasing in quantities, but active demand prevents any accumulation of stock. The poultry markets have been very fully supplied during the month, but, a large proportion not being fit for table use, it would have been more profitable if owners had fed up better before sending them in. This caused prices all round to slacken, so that average rates realised did not rule as high as previously; there is still, however, good sale for fit table birds, and the high price of meat renders any collapse improbable. The carcass meat season has commenced, and, although values have hardly yet become settled, there is every probability of good demand for farmers' veal and pork during the coming winter.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide, 2s. 7½d. to 2s. 8d.; outports, 2s. 6d. to 2s. 7d. per bushel of 60lbs.
 Flour.—City brands, £6 to £6 5s.; country, £5 10s. to £6 per ton of 2,000lbs.
 Bran.—10d.; pollard, 10d. to 10½d. per bushel of 20lbs.
 Oats.—Local Algerian and dun, 1s. 7d. to 1s. 9d.; ordinary stout feeding, 2s. to 2s. 2d.; plump white, to 2s. 6d. per bushel of 40lbs.
 Barley.—Malting, 3s. to 3s. 6d.; Cape, nominal at 2s. per bushel of 50lbs.
 Chaff.—£2 12s. 6d. to £2 17s. 6d. per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.
 Potatoes.—New locals, £5; Gambiers, £4 8s. to £4 10s. per 2,240lbs.; Tasmanians, £4 15s. to £5.
 Onions.—Locals, £5 10s. to £5 15s.; Gambiers, £5 18s. per 2,240lbs.
 Butter.—Creamery and factory prints, 1s. 5d. to 1s. 8d.; private separator, 1s. 2d. to 1s. 4½d.; best dairy, good store and collectors', 11d. to 1s. 2d. per pound; imported bulk, 1s. 1d. to 1s. 3d.
 Cheese.—S.A. factory, 7½d. to 8½d. for best; medium to good, 7d. to 7½d. per pound.
 Bacon.—Factory-cured sides, 7d. to 7½d.; farm lots to 6½d. per pound.
 Hams.—S.A. factory, 8½d. to 9½d. per pound.
 Eggs.—Loose, 1s. ¼d.; in casks, f.o.b., 1s. 2d. per dozen.
 Lard.—In bladders, 6½d.; tins, 6d. per pound.
 Honey.—2d. for best extracted, in 60lb. tins; beeswax, 1s. ¼d. per pound.
 Almonds.—Soft shells, 4d. to 4½d.; kernels, 10½d. per pound.
 Gum.—Best clear wattle, 2d. per pound.
 Carcass meat.—Porkers, worth 4½ to 5½d.; good baconers, 4d. to 4½d.; vealers, 2d. to 3d.
 Live Poultry.—Heavy-weight table roosters, worth up to 2s. each; fair birds, 1s. 3d. to 1s. 9d.; light cockerels and ordinary hens, 11d. to 1s. 1d.; small and poor birds, 9d. to 11d.; fair table ducks, 1s. 3d. to 1s. 9d.; good, worth up to 2s.; small and medium, 1s. 2d. to 1s. 4d.; ordinary geese, 2s. 6d. to 3s.; prime, up to 3s. 10d.; pigeons, 7d.; fair to medium turkeys, 4½d. to 5½d.; good table birds, up to 6½d. per pound, live weight.
 Above quotations, unless when otherwise specified, are duty-paid values on imported lines.
 Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

WEATHER AND CROP REPORTS.

BAKARA (March 23).—The weather has been moderate. On the 2nd a thunderstorm passed over parts of the district and in some places brought 3in. of rain. Seeding operations in full swing and green wheat is already to be seen. Feed expected to be plentiful, and stock are in good condition.

BALAKLAVA (March 23).—Farmers are looking out for rain, especially those who are water-casting; the thunderstorms of the past month missed this district, and even drinking water is becoming scarce. Scrub farmers are busy ploughing and on the plains are rolling and harrowing down fallows. Several farmers have commenced sowing on new land. There have been several complaints of loss of cattle from impaction during past month; otherwise stock are healthy and in good condition.

BRINKWORTH (March 27).—Sowing has commenced, and rain is anxiously looked for, as very little rain has fallen for a long time; 1·22in. have only been recorded for this year.

CARRINGTON (March 23).—The weather to date has been exceptionally cool. Seeding operations are in progress, and some farmers have nearly finished. On account of the northern rains missing this district the seed has to be sown on dry soil again, and no weeds can be destroyed. There is no feed for stock, and if rain does not fall soon stock will get very poor. As soon as the cold weather well sets in the ewes and lambs will have a bad time of it, and it is feared the percentage of lambs will be low.

FOSTER (March 21).—The weather for the past month has been very changeable, and only a few very light showers of rain have fallen. Feed is very dry, but plentiful. Stock in good condition. Seeding operations in full swing.

JOHNSBURG (March 19).—A thunderstorm passed over on the 2nd, and filled several dams and tanks. The rain was very patchy, but those who were getting short of water will find it an advantage to get on with their work instead of carting water for stock. Already a lot of ground is sown and waiting for the rain. Stock are in good condition, but feed not very plentiful. Weather pleasant.

LUCINDALE (March 23).—A very dry month, and not enough rain has fallen to start the early-sown green feed crops. The weather has been fine and cool. Stock are in splendid condition, and some farmers are now forwarding fats to market, and it is expected that regular supplies will be sent from here during the next two months. The fruit crops are turning out well, but the parrot and silver-eye pests are worse than usual, the former especially destroying large quantities of pip fruits.

MILLCENT (March 23).—The weather till within the last few days has been extremely dry, but some nice showers have fallen lately. The oldest residents have never seen the country drier, but stock all look well. The potato yield will not be as good as usual, owing to want of rain: a frost a few nights ago cut some of them badly. Some farmers are ploughing.

MOUNT REMARKABLE (March 26).—Since last report the rainfall recorded here amounted only to 0.84 in. For the last fortnight no heat has been experienced, cool southerly winds ruling. Good rains required to replenish dams, tanks, &c.

ORROBOO (March 22).—The weather has been hot and sultry. Heavy thunderstorms have fallen over some parts. A good general rain is much needed. The majority of farmers are now tilling, and a large area will be put under crop.

STANSBURY (March 28).—The weather has been very dry, but cool and pleasant. Stock are looking well for this time of the year. A good rain is needed now to start the grass. The vintage is nearly over, and seeding will soon be in full swing.

WILSON (March 26).—The weather since the heavy rain of a month ago has been dry and generally cool. Just now it is close and sultry, and rain seems to be coming. Almost all growth started by the early rains has disappeared, and the country looks dry again. Seeding operations are in full swing.

YORKTOWN (March 25).—Grass fairly plentiful, and stock in good condition.

AGRICULTURAL BUREAU CONFERENCES.

MURRAY RIVER BRANCHES.

The second Conference of Branches on the Murray River and adjacent districts was holden at Mannum, on Tuesday and Wednesday, February 26 and 27, under the presidency of Mr. J. G. Preiss, Chairman of Mannum Branch.

Branches, &c., Represented.

Mannum: Messrs. J. G. Preiss (Chairman), O. A. F. Faehrmann, J. A. Schulze, E. Schuetze, B. Baseby, J. S. Nickels, G. Lenger, Hy. Brown, J. W. Walker, R. Heidrich, F. W. Kowald, R. P. Scott, J. L. Scott, H. Wilhelm, J. W. Haly. Gumeracha: Messrs. D. Hanna, W. A. Lee, W. Jamieson, and A. Moore. Murray Bridge: Messrs. J. G. Jaensch and W. Lehmann. Bowhill: Messrs. Ernest Drögemuller, C. Drögemuller, and E. P. Weyland. Central Bureau: Messrs. F. E. H. W. Krichauff (Chairman), A. Molineux (Gen. Sec.), G. Quinn (Horticultural Instructor), G. S. Thomson (Dairy Instructor). Visitors: Mr. Geo. Jeffrey (Wool Instructor, School of Mines and Industries) and about 150 ladies and gentlemen.

Exhibits.

Mr. E. Schuetze (Mannum) tabled some brinjals, grapes, and pears, all of splendid growth. Mr. Lee, of Gumeracha, tabled a sunflower head 18 in. across. Mr. J. G. Preiss brought a lot of softshell almonds.

Addresses.

The CHAIRMAN was pleased to again meet the members of Branches and visitors. The past season had opened well, but the latter part had ended in a failure with many farmers. Some had benefited to a certain extent from having used superphosphate. Over 220 tons had been landed at Mannum last season. Takeall (so called) had destroyed quite half of the crops. Many farmers believed that by growing oats the takeall would be exterminated. The dairying industry was a fairly good paying one where there was a piece of swamp land attached to the farm; but there were troubles connected with the sending of cream to the factories in the city which required rectification. Sheep were a good source of profit, and every farmer ought to keep some at least. He considered the work done by the Agricultural Bureau, as an organisation, was signally beneficial to all the rural industries.

Mr. F. KRICHAUFF said the important work of the Agricultural Bureau of South Australia was recognised not only by our own producers but also by those of many other countries. Statesmen of Cape Colony, and of parts of America, had made earnest inquiries into our system of working, and Western Australia and Tasmania had already adopted the system, whilst inquiries had come from Victoria and New South Wales; and only a few days previously a powerful political leader in Queensland had written him for full particulars with a view to the establishment of an "Agricultural Board" on similar lines in that State. Our Bureau undoubtedly could do even better work with the aid of more funds, and promises in this direction had been recently made. He referred to artesian water having been obtained near Adelaide, and hoped that many artesian springs would yet be discovered, as these would enable a great deal of back country to be opened up for running sheep.

THE GENERAL SECRETARY mentioned the work of the Bureau in connection with spraying to cure fruit tree diseases, which had saved many thousands of pounds annually in each fruit-growing centre; to the establishment of co-operative factories, resulting in butter export, and, as a corollary, to the Produce Export Department; to the increase in wheat yields through the use of small quantities of phosphates, which practice he admitted had been constantly advocated by both of our Professors of Agriculture and others, but was not generally adopted until the Minlaton Branch reported successes and other branches took it up. Then a very large increase in the area under vines and fruit trees had occurred through the advocacy of the right sorts and the proper methods by the Bureau, and these few items alone amongst innumerable other useful work, he thought amply justified the inauguration and continued existence of the Agricultural Bureau of South Australia.

Wool.

Mr. G. JEFFREY, Wool Instructor to School of Mines and Industries, addressed the members on "Wool," to the following effect:—

Farmers in various districts are now taking much more interest than formerly in sheep; and earnest inquiries in many districts were being made with regard to the best classes of sheep for farmers' purposes, and with respect to the treatment of the wool. He had visited very many places to give information upon these subjects, and had been immensely aided in this practical work by the numerous branches of the Bureau all over the State. No farmer could afford to do without sheep, but they must be of the right kind. In and around this locality the climate is too dry and too uncertain to allow of the crossbred sheep being profitable. This class of sheep require the best of food, and plenty of it, and such conditions do not prevail here. Then the crossbred wool is not so profitable as the wool from the best and strongest types of Merino. Sometimes a fair price might be obtained, but prices for crossbred wool are too uncertain and fluctuating, and there seems to be no prospect of a rise for this class; and the supply of high fine wool is so great that there is always a surplus. In Argentina there are as many sheep as in all Australia; and 75 per cent. of the Argentina sheep are crossbreds. The price of good strong Merino wool is likely to rise. The best kind of Merino is the large-framed, robust sheep, growing a good strong wool. Some people advocate the finer sheep, because their wool brings a much higher price—but this is a fallacy. There is practically no difference in price between fine wool and the stronger wool. The larger sheep have better frames, and give a greater weight of clean wool. As the sheep gets older its wool gets finer—which proves that the constitution and strength of the animal is less than when it was young. Strong wool must have plenty of "character," or close wave, in its texture. Do not strive for too much density. Where extreme density prevails there is a lack of length. Consider the length first, and then try the density. Density will not prevent sand getting into the wool; but when sand gets in it has much difficulty in getting out again. Dense wool is grown upon small animals, which are naturally weak, and when we try to increase the burden the small animal cannot carry it. He then instanced some sheep-breeders who introduced Vermont rams to their light-framed flocks, with the result that the sheep could not carry the weight, and gradually went back in constitution and in profitableness. Mr. Jeffrey then repeated the observations made at Gladstone and Quorn conferences upon the proper way to sort, class, and pack wool, for market; also upon the care and treatment of sheepskins.

In reply to questions, Mr. Jeffrey said the Shropshire and Merino first cross was admirable for export frozen lambs. He thought it would occupy too much

time at any conference to have various fleeces, and to illustrate, practically, the methods of treating and packing the fleeces—this would be subject for a separate demonstration. Mr. J. G. Preiss would not advise anyone to keep crossbred ewes, as they were troublesome in breaking fences, and produce an inferior class of wool. Mr. Jeffrey replied to Mr. Lehmann that yolk acts as a preservative of wool, and manufacturers prefer to purchase wool with the yolk in it on that account. He recommended that greasy-woolled sheep should always be the class kept. He thought that ultimately all the large stations would shear with machines, but it would be out of the question with small farmers to use machines. Insufficiency of water would more seriously effect the amount and quality of wool than insufficiency of feed. As there is an import duty in America of 5 cents per pound on wool, the buyers from that country have to be particular to purchase such that has less quantity of dirt in it. Sheep will deteriorate on bad feed, and it is always necessary to introduce fresh vigorous blood into all flocks. The discussion was continued at considerable length.

Sheep and Wheat on the Murray Flats.

Mr. W. LEHMANN (Murray Bridge Branch) read a paper entitled "Keeping Sheep in conjunction with Growing Wheat with Artificial Manures on the Murray Flats," as follows:—

To grow crops with the aid of artificial manures on the Murray Flats, and to rely upon wheat-growing alone, is neither a wise nor a profitable undertaking. Though you may combine dairying with wheat producing, dairying can only be carried on successfully by those holding river frontages with the use of the swamps as pasture through the summer months. You may combine horse-breeding with wheat-growing, but still there is something wanting on the farm to make farming the success that it should be.

It is a fact that artificial manures drilled into the soil to produce wheat on the Murray Flats leaves a residue of the manure in the soil after the crop has been produced. This manure remaining in the soil, and very near the surface, will produce an abundance of feed the following season, and if not sufficiently fed down will overrun the paddocks with grass seeds that will prove very troublesome when again putting in your paddocks for wheat. To overcome this trouble, and to secure the best return from the grasscrop, you must keep a flock of sheep. Now the question arises which is the most profitable class of sheep to keep. It has been the practice of the greater number of the farmers who have kept sheep in the past, not being very particular of the class of sheep so long as they seemed to be good sheep, to be satisfied, regardless of the fact that perhaps their sheep produced an inferior class of wool or a low average quantity per head. Though farmers are not quite so indifferent now-a-days as to the class of sheep there is still much to improve in the selection, in choosing rams, in culling breeding stock, and in rearing lambs for their future use.

I will give a short history of a few flocks kept in our district, and their average quantities of wool produced per head, and prices obtained per pound. It was asserted by a well known leading farmer in our district that, to obtain the very best results, farmers must keep a cross of the Lincoln and Merino sheep that would not only produce wool but also a good carcass of meat, so as to obtain a good price when selling off the surplus sheep to the butcher. Now, this seemed good advice and was followed by a number of farmers, but when an inquisitive farmer wanted this assertion substantiated by actual experience and figures, it could not be given; in fact he had to await another shearing time to obtain reliable particulars as to quantity of wool produced per sheep and prices obtained per pound, and the results were as follow:—No. 1 flock of Lincoln-Merino cross cut an average of 6½lbs., price 5d. per pound; No. 2 flock, to all appearance pure Merinos, cut an average of 8½lbs., price 5½d. per pound; lambs cut 3lbs. wool, price 4½d. per pound; No. 3 flock of pure-bred Merinos, bred from the famed Murray's flocks, cut 9½lbs. of wool, price 5½d. per pound; lambs cut 4½lbs. of wool, price 4½d. per pound. This proves that the pure-bred Merinos produced wool in value of 4s. 3d. per head lambs, 1s. 8½d.; the to all appearance pure-bred sheep, 3s. 10½d., lambs, 1s. 1½d.; the cross-bred flock, 2s. 8½d. The cross bred sheep require more feed and water, are apt to ramble, require better fences, and would give more trouble to keep them out of the wheat crops.

Now the question arises would it pay to procure a first-class breed of sheep in place of the ordinary sheep of no particular breed at all. If you bred from a ram of ordinary breed, though he may have a good fleece and to all appearance be a fine-looking sire, it is not certain that you are going to breed good wool sheep by him, because you never know what his ancestors were, and he is likely to throw back in his progeny, and you may in return get a thin fleeced, sorry-looking flock, of no particular value. But in breeding from good stock of a well-known

pedigree, choosing deep-chested, large-framed ewes, with a dense fleece of white wool, and procuring a sire which has a long string of ancestors of prizetakers as first class wool sheep behind him, you can then rest assured that your flock will not throw back into a bad class of sheep. When you have procured a flock as described you must not suppose that you have done all that is required for a number of years, but you have your work cut out for you to keep this flock from degenerating into small ordinary-looking sheep, as there are such innumerable duties to attend to to make sheep-breeding the success that it should be. I will, therefore, only mention a few of the most important parts that should be attended to. When mating your ewes this should be done so that your lambs would be dropped at a time when there is sufficient green feed to keep them growing rapidly, and on no account starve your lambs by keeping them with the whole flock in much-fed-down paddocks, as it is those lambs that are to make your future flock, and it is in the beginning (if proper attention is paid to the rearing of your lambs) wherein you will succeed in rearing the finest sheep. The best plan, I find, is to reserve a paddock for your lambs, and to transfer the ewes and lambs to this paddock when the lambs are a few days old, or to place the ewes in the reserved paddock before lambing; but you will then have to pay greater attention to the ewes if the feed is first class, as they are apt to get flyblown after lambing.

A very important part to be attended to is the culling of sheep, and this should be done at shearing time; but to do this you must understand all good points in sheep and have a fair knowledge of wool. If you choose deep-chested sheep, with strong thighs and large bodies in proportion, as those points denote large lung power, strong constitutions, capacious storage power, and quite docile disposition, as it is the large-bodied sheep that will grow the greatest quantity of wool, the strong digestive organs to digest and turn weeds, shrubs, and even mallee shoots into wool. I would advise farmers not to destroy and exterminate all the native shrubs and trees that were existing when the land was selected for farming, as a great number of them are good sheep feed at the time of the season when grass becomes scarce; in the absence of any green grass through the summer months these shrubs are eaten by sheep, and are a fair substitute for green grass. These shrubs and trees will prove to be a stand-by through exceptionally bad seasons, and would be the means of saving the flock. I also find it very beneficial to the sheep to shift them as often as the size of the paddock would require it, especially in the winter months when the young grass becomes soiled and dirty by being overrun by the sheep. If no shade trees exist in the paddocks then should there be clumps of trees planted to give the sheep the necessary shade in the summer and protection from cold wet weather in the winter. If it is possible water should be provided in every paddock, as travelling to water any distance will interfere greatly with the sheep remaining in good condition, would destroy a lot of grass, and to a certain extent spoil wool. If you do not overstock, and undertake to keep sheep in the manner herein suggested, you can rely on being successful with sheep.

The Chairman remarked that all kinds of stock prefer to graze upon stubbles that have been fertilised with phosphatic manures. He had long been in the habit of sowing some oats on his stubble and harrowing them in. Not only did he get an early stand of nice green feed; but, after closing those paddocks against the stock, he had reaped from three to four bags of oats per acre. Mr. Lehmann said he could now keep twice as many sheep as before, since using phosphatic manures, and he had found that sheep would fatten on stubbles and green feed. The Chairman said average scrub land would support a sheep upon two acres, though some land would keep one sheep to an acre. It does not take as much feed to keep a sheep upon the plains as upon the hills, because the sheep really require more feed to maintain life in cold country than in warm. Where part of the farm is regularly cultivated it is easy to keep more sheep than on natural fodders alone. Mr. Lehmann found it difficult to make profit in breeding lambs for export, chiefly on account of scarcity of feed in his dry locality. His best plan was, when he had plenty of feed, to buy up stores and fatten them.

Subsidy for Purchase of Bulls.

Mr. J. J. JAENSCH read a paper entitled, "Is it a Wise Policy of the Government to give a Subsidy to Agricultural Bureau Branches to Purchase Dairy Bulls," to the following effect:—

I hold that the proposed system is not wise. It is unjust, because it is public money collected from the whole community, whilst only a few can avail themselves of the aid, and these few are in a condition to help themselves—not like the farmers in the Far North, who have lost nearly all they had, but are still trying to improve their stock. A proverb says, "God helps those who help themselves." It is discouraging to the industrious men who have with

their own means imported pure stock of milking grades, and are keeping them up to a high standard by carefully culling out inferior ones. There are several breeders who have taken many first prizes in the inter-State shows for the Jersey breed, and still, with all these sires and dams, there is little or no inquiry by dairy farmers who are seeking Government aid for grown-up bulls, which would cost at least from £12 upwards, whereas pure-bred bull calves could be obtained from breeders at a much lower rate. Another advantage would be in buying calves as soon as they were dropped; they could be sent to any part of the State in a box by train for a trifle, or taken by a vehicle, and hand-reared among other calves on the farm. The owner would be "boss" at the start, but by buying a grown-up bull the bull might be boss; at all events there would be danger before both bull and owner knew which was the master. I would suggest that the Government purchase eleven cows of a milking breed and use one of the bulls already in hand, and put them on the Government farm. Presuming there would be five bull calves dropped during the year. Estimate the cows at £15 each, the bull at £25, making a total of £190. The milk of the cows should pay for their feed and labor, including delivery of bull calves on trucks. Bull calves and heifer calves should be the same value as their sires and dams when they are three years old. Let us say they are delivered at the railway station at £2 the bull calf; heifer calves should be worth £1 when dropped. Reckoning nine calves from the eleven cows a year—five bull calves, £10, four heifer calves, £4—interest to the Government on the outlay, £14 (5 per cent. per annum for interest on the capital, and 4 per cent. per annum for replacing any loss in the stock of the stud herd). Purchase of bull calf, £2; depasture until 3 years old, £7 16s.; cost of box for sending calf, 4s.; cost to the farmer, £10; value, £25. Private property to the owner, £10; gain to the farmer, £15. The present system is a hired bull that cost the Branch £12.

Mr. Jamieson said the proposal of the essayist was not so good as the present system, because the Government would be in the position of competing against private breeders. Mr. Lehmann would prefer that farmers should be more independent and purchase their own bulls. The present system was something like pauperising the farmers. Where a man owns thirty or forty cows he should have his own bull.

EVENING SESSION.

Horticulture.

Mr. GEORGE QUINN, Horticultural Instructor, addressed the meeting to the following effect:—

From the samples of fruit shown on the table he thought there were possibilities for growing at least some varieties to perfection. *Re* codlin moth, he considered the pest was treated with too much levity. Some very misleading and erroneous statements have been published in a newspaper recently. One statement, that the fruit houses were filled with the eggs of the codlin moth—that was not in accordance with the facts of the case, because the codlin moth does not lay its eggs in the fruit houses, but only upon the fruit (and sometimes on the leaves). Another statement, that the fruitgrowers could be left to look after their own interests, and would spray and bandage and do all other acts to protect those interests without any State interference. Some growers undoubtedly would do so but many others would not, and the result would be that the whole place would be flooded with "wormy" fruit. This dirty fruit would, of course, have to be offered for sale at very low prices, which would naturally decrease the value of the sound fruit. Then, again, were there no restriction upon the sale of wormy and diseased fruit, the Governments of the other States would either prohibit the import of such fruit, or the inspection required before any fruits would be allowed to cross our borders would require an army of inspectors who would need to inspect every individual fruit before he could certify that the whole of the parcel—often 200 to 400 cases—was perfectly free from all disease. The intercolonial export would thus be hampered much worse than at present. It would not pay to export injured apples to Europe owing to the high charges for freight, &c. The result of this would be to restrict export, and the natural consequence must be to flood the local market. If the export continued under these circumstances the sound fruit would go away and the local demand be met by inferior and damaged fruits only.

It is desirable to increase the consumption of apples and pears locally, and the speaker did not believe this would be accomplished by selling them in a damaged condition. No man could maintain a trade if he honestly asked consumers to buy damaged goods, when the sound article could be bought at about 1s. 3d. higher price. He contended that if every individual grower conscientiously attended to the precautions recommended in the regulations the quantity of moth-damaged apples would be reduced to a minimum. Our large area under keeping apples would produce sufficiently large quantities of sound fruits, which were unsuitable for export owing to unevenness of size, to supply our local requirements without resorting to the moth-damaged

fruits. In Tasmania similar regulations to ours were enforced; and in some parts of America the sale or distribution of moth-infested fruits were interdicted by law. At a recent conference in Melbourne two large growers attended and asked the conference to pass a motion affirming the desirability of the laws being made uniform in all the States on the lines adopted in South Australia and Tasmania respecting the sale of moth-infested fruits.

The GENERAL SECRETARY described the method of marketing fruit as adopted by some Californian growers. First, the fruit was gathered by gangs under overseers, with the greatest care to avoid bruising and to secure perfection in every shape. No immature, ill-shaped, or badly-colored fruit was packed. The crates were perfectly ventilated, and were carried on spring vans to the railway depôt, placed in special fruit vans, locked and sealed by the owner or his agent, dispatched 2,000 miles to Philadelphia or other large cities, opened there by owner's agent, fruit carried to his warehouse and distributed to grocers' stores all over the city. Grocers dealt with fruit just as with rice, tea, &c., kept a fruit counter where fruit lunch pails could be purchased at say 2½d. Artisans, clerks, merchants, purchased these fruit lunches, returning empty pail in afternoon, and were allowed ½d. on them, and they usually took home a package of assorted fruits for their families. By this means fruit could be sold cheaply, and yet the grower obtained higher prices than if it were sold only at special fruit shops, as the men, vehicles, &c., which run the groceries also run the fruit. Each grower and each packer places cards in the packages, which not only advertise the firms, but serve as a guarantee of quality and of honest packing. Mr. Krichauff said many of the German growers of fruit, &c., have their own shops, kept by members of their own families. In answer to questions, Mr. Quinn gave a short life-history of the codlin moth. The first caterpillar has lain hidden in a cocoon since last season. When the apple blooms appear that caterpillar has changed to a chrysalis, and then emerges as a codlin moth. The moth lays a great many eggs, mostly upon the little apples, pears, and other pip fruits, but sometimes on adjacent leaves. In about four days the caterpillars emerge from those eggs, and soon commence to eat their way into the fruit, where they burrow for about three weeks, ending usually by eating the seeds or pips. Usually the fruit then falls to the ground, but sometimes it hangs to the tree. The caterpillar drops by a silken thread till it reaches a limb or the ground, and at once seeks a hiding place, where it spins a slight web or cocoon, changes to a chrysalis, and soon emerges as a moth. If the fruit drops with the caterpillar in it, the caterpillar leaves the fruit and crawls to the nearest hiding place—always avoiding wet places or positions where danger threatens its continued existence. If the fruit is packed in boxes, or placed in heaps, the caterpillar gets into a dry corner or crevice. If the boxes are emptied, and thrown or jarred much, the insect leaves for quiet corners. The codlin caterpillar has been reported by casual observers to propagate in tomatoes, potatoes, plums, apricots, peaches, and to live upon stringybark trees, fence posts, &c., but no *authentic* case had been recorded where the codlin moth had been matured upon anything except apples, pears, quinces, medlars, or similar fruits which produce pips. The caterpillar found attacking peaches, tomatoes, &c., were not those of the codlin moth, but were of totally different species. If stringybark trees, or posts, or any suitable hiding place exist close by, when the caterpillar wants to hide and spin its cocoon, it would just as readily resort to such place as it would to the stem of an apple tree.

Dairy Progress.

Mr. G. S. THOMSON, Dairy Instructor, addressed the meeting to the following effect:—

The dairy industry in this State was slowly but steadily progressing, and during the past year several new factories had been established. But there were some places where food was not plentiful enough, or sufficiently reliable from natural sources to ensure success. Federation would probably close some of our factories unless our dairymen take up the cultivation of fodder

plants of the best quality. Complaints had been made of short returns from cream sent to butter factories in the city, but he was sure that this could be traced to adverse conditions attending the treatment of the cream prior to its being sent, and the temperature and jarring to which it was subjected during transit from points along the river till it reached Adelaide. Much could be done by the dairymen to modify those adverse conditions, but very few would adopt the suggested remedies. The cream should be aerated and cooled directly after separation; when fresh cream is added to older cream the two should be mixed by stirring. Cream should not be kept too long till it became too acid and the cream cans should be enveloped in cloths whilst in transit on the steamer. The agent for the *Tyro* had promised to keep the cloths wet, thus ensuring cool conditions, but up to the present only two suppliers had adopted this sensible plan of covering the cream cans. The shortage in butter from cream sent to the city factories was undoubtedly due to the absence of proper cooling of the milk and of the cream, as also to the high temperature and enhanced acidity resulting therefrom, acquired during transit from the dairy farm to the factory. Often the cream was kept too long, and much loss of butter was the result. He detailed many other causes leading to the heavy losses between the owner of the cream and the manufacturer of the butter.

Quite a long and animated discussion ensued, during which numerous questions, relevant and irrelevant, were put to and answered by Mr. Thomson.

Social.

The evening finished up with a social, when light refreshments were dispensed to about 150 members and visitors by several hospitable ladies of Mannum, and songs and recitations, with instrumental music, were given by able artists; finally some dancing wound up an enjoyable session.

MORNING SESSION.

On Wednesday, February 27, the final session was held, with Mr. J. G. Preiss in the chair.

Fodder Crops.

Mr. D. Hanna, of Gumeracha, read the following paper:—

The growing of fodder crops and their value for feeding stock and for cleaning dirty land are subjects that do not receive sufficient attention by farmers in localities where the rainfall is reliable and heavy. Wild oats, sorrel, and stinkwort usually take possession of land that is frequently under cultivation in such districts, and if ever they are to be exterminated the farmer must either be in a position to spell his land, fallow it, or increase the area of spring and summer fodder crops. If wild oats or sorrel have once firmly established themselves in the land it is almost impossible to grow a clean or heavy cereal crop, especially when the farmer has to crop the same portion of his farm for several successive years, and still adheres to the system of simply ploughing and sowing his land at the usual seeding time. Stinkwort has no apparent effect upon a cereal crop, but considerably reduces the grazing value for a number of years after it has been out of cultivation, and it also increases labor at seed time. In districts where the rainfall is assured, the dairying industry firmly established, and other conditions favorable, an increased area of fodder crops should be grown, and the best way to do this is to work the land from which the cereal crop has been taken as soon after harvest as possible, to cover wild oats and other seeds. With the first good rains they will start growth, and may be kept fed down with cattle or sheep right through the winter if the ground is firm enough to carry either of them. If mustard seed were sown broadcast at the rate of 6lbs. or 7lbs. per acre when the land is being worked it would well repay the cost of seed, &c., sown. In September or October plough this land and work it down to a fine tilth, and sow it the same month with 4lbs. or 4lbs. of Broadleaf Essex rape, swede or other turnips. The seed should be mixed and sown with the manure at the rate of 1cwt. or 2cwt. per acre, according to the quality of the land, and sown in drills 14in. or 16in. apart. This is easily done by closing every other drill. Cover the seed about ½ in. deep, and follow the drill with a roller. When the crop is 4in or 5in. high run the horse hoe between the drills, or harrow the crop after rain, to kill weeds and assist the growth of the plant, which should always have enough manure to give it a good start. Last year I had nine acres of rape, and fed it off three times before April; it carried five sheep to the acre during that time, and they were in prime condition. Of course it is like other crops, and requires a favorable season to give the best results. I am satisfied that this is the most profitable and quickest way of cleaning the land without impoverishing it. Kangaroo swede turnips, sown at the same time did well also, and may be carefully grazed with sheep. Cattle or pigs would soon clear the roots out after the sheep had done with the tops. Mustard is better than rape for sowing before the early rains. For dairy cows maize or sorghum is best, but the crops previously mentioned will enrich the soil to a greater extent, especially if they

are ploughed in green. If the farmer thought it advisable to crop his dirty land instead of grazing it (as before recommended) an early variety of wheat or oats should be sown and cut for hay before the wild oats are ripe, and the hay removed or carried into where the stocks are to stand as soon as possible after being cut. The objection to cutting a self-sown crop for hay is that a fodder crop could not be grown, and the probabilities are that a much better crop of wild oats would be grown the following season. I do not believe in feeding green fodder to cows in winter; far better results would be obtained if good lucern hay, grass hay, or ensilage were fed to them in winter, and more attention given to the growth of fodder, to be fed to or grazed by stock during the summer months when the natural grasses are dry. Owing to the low price of hay and wheat, more attention must be given to the dairying industry in suitable localities, and the stock-carrying capacity of the land increased. A portion of the farm could be sown each year with rape, and should be made sheep-proof if possible. Do not turn sheep or cattle on it when they are hungry or when the crop is wet, nor should it be grazed too bare, or the crown of the plant will be injured and will not grow a second time. This applies to turnips also; either of them will taint milk and impart a strong flavor to the butter if fed to cows. Maize or sorghum is best for dairy cows, and will improve the quality of the butter. Lucern is one of the very best fodders that can be grown; it is beneficial to the land, stock are fond of it, and no other hay is equal to it as a food for dairy cows. If cut green it should be allowed to wilt in the sun before being fed to the cows; this will largely prevent a taint being given to the butter. Lucern will not stand constant and close feeding. The best results will be obtained if a portion or the whole of it can be top-dressed with farmyard manure every other year, or oftener if possible, and the crop mown for hay. Treated in this way it will produce a large amount of fodder for many years. It would be difficult to imagine what could be done if a portion of the water that runs to waste in our chief dairying districts could be conserved and used for irrigating summer fodder and root crops. There are other fodder crops which could be grown, but those I have mentioned are the most reliable and would give the best results at the least cost. No intelligent farmer should have fallow in a very moist district, and if the system of cultivating the land after harvest is adopted, sorrel and stink wort will be considerably lessened; wild oats and other seeds will start growth with the first good rains. Land treated in this way, and afterwards ploughed and sown with a fodder crop in spring, is the most effectual method of cleaning it, and at the same time increases the stock-carrying capacity of the land at a time when the price of produce is good and green fodder scarce.

During a lengthy discussion the importance of conserving the moisture in the soil during winter was mentioned. It was suggested that in dry districts the flood waters from roads and catchment areas should be turned on to orchards, vineyards, gardens, and fields; that contour channels and reservoirs should be made to intercept the water, to hold it in suspension, and to promote a good soakage into the ground. A question was raised as to whether second crops of rape would be injurious to hay, and answer made in the negative, unless woody stems were cut with the hay. Several members spoke of the improvement made to pasturage through application of super. and other phosphatic manures, and the health of the stock was also improved. Captain Randall spoke of the great advantage derived by him from ensilage fodder, and he regretted that so few of our South Australian farmers avail themselves of ensilage. Discussion on these matters was prolonged. Mr. Weyland, of Bowhill, had been twenty-four years on the river, and he noticed that many farmers let their land become very dirty, and failed to properly plough and cultivate their farms. He had been successful in his operations through keeping down weeds, and by thorough cultivation. When the weeds became too plentiful he gathered them into heaps and burned them. Mr. Faehrmann, Mannum, did not at all agree with burning stubbles. Of course, if the straw were ploughed under and the land were cropped next season the land would be too hollow, and the crop would suffer. If it were possible to plough and sow, and yet have the straw on the surface, it would be very beneficial; but, in the absence of this possibility, it would be better to leave the stubbles for pasture, or else to gather the straw as food for stock. On the light soil of the Mannum district it was necessary to plough in all rubbish to hold the sand together and prevent drifts. No one here thinks of growing a crop on land that was cropped last year. Captain Randall said he uses a deal of sheaved header straw steamed and mixed with copra cake, bran, or meal for his cows. He gives as much as 11b. of copra for each meal for each cow.

Resolutions.

Delegates to Congress.—“This Conference is of opinion that the cost of conveying one member from each Branch of the Bureau to Congress in Adelaide should be borne by the State.” Carried by a small majority.

“That it is desirable that a Conference of Branches should be holden during the year at Gumeracha in addition to one at Mannum.” Carried unanimously.

“That the thanks of this Conference be accorded to the ladies and gentlemen who contributed refreshments, music, songs, and recitations for the social.” Carried with enthusiasm.

“That the **Chairman** and **Hon. Secretary** of Mannum Branch be heartily and especially thanked for their efforts in connection with this very successful and instructive Conference; and that cordial thanks are also hereby given to the writers of papers, addresses, &c., and to all others who have helped to make this Conference a successful one.” Carried with applause.

Meeting then broke up.

SOUTHERN BRANCHES.

The ninth Annual Conference of Southern Branches of the Agricultural Bureau was holden at Strathalbyn on March 22, and there was a most disappointing representation of Branches, except as regards the Strathalbyn Branch and about a dozen visitors.

Branches Represented.

Strathalbyn: the Hon. J. L. Stirling, Messrs. M. Rankine, G. Sissons, D. Gooch, A. Rankine, H. H. Butler, P. Cockburn, W. J. Tucker, W. M. Rankine, R. Watt, G. H. Meikle, and J. Cheriton. Finnis: Messrs. W. W. Heath, A. Green, and S. Collett. Mount Compass: Mr. S. H. Herring. Central Bureau: Prof. W. Lowrie (Principal of the Agricultural College), and Messrs. C. J. Valentine, H. Kelly, and A. Molineux (Gen. Sec.), and also Mr. G. Jeffrey (Wool Instructor).

Exhibits.

By Hon. J. L. Stirling, M.L.C. (Strathalbyn Branch): Duchess pears, and Sweetwater, Crystal, and Chasselas grapes. By Mr. Matthew Rankine, Strathalbyn Branch: Pie melons, pumpkins (including a very large intensely dark-brown variety), squashes, sixteen varieties of apples, and an excellent lot of Cape currants. By Mr. W. W. Heath (Finnis Branch): Cucumbers—White Spine, Long Green, and Japanese Climbing; bottle gourd, vegetable marrows, trombones, Green Burgess, bush marrow, Hubbard squash; beans—bush, butter, snake, and White Dutch; sauce tomatoes and seedling tomatoes.

Preliminary.

Mr. J. Sissons took the chair, and, in a very short address, welcomed the members of Branches and visitors. He then called upon Mr. Henry Kelly (of Central Bureau), who read the following paper:—

The Practical Farmer.

In the course of an address at the Way College, Sir Samuel Way paid a high tribute to the value of the services of Professor Lowrie. The Chief Justice said that as a practical farmer he had tried the old-fashioned plans and also Professor Lowrie's methods, with the result that while land treated on the old principles had produced 16bush. to the acre, 150 acres of similar land scientifically farmed had returned 23bush. to the acre. Another block more generously treated gave a harvest of 32bush., and his manager informed him that from that part of the colony they might look forward to an average of 25bush. to 30bush. to the acre. Now, had any of the students asked the Chief Justice what he meant by “a practical farmer” he would most likely have told them that a practical farmer was one

capable of applying knowledge to some useful end, and that "scientific farming" meant "knowledge of the cause and effect founded on observation and experiment." The Chief Justice was not ashamed, but had the courage to say, where he got experience. It must be pleasing to those who are anxious to see the farming interest progress to witness the large numbers who visit the Agricultural College in September. It is a good sign. Many of our farmers return in a more hopeful spirit, while others, I am sorry to say, leave with the old song, "If I had the money I could grow as good crops as the professor." Such farmers will never make farming a success. I got a son of one of my old workmen to visit the College. He had good experience as a farmer. I knew his farm; it was in a part where there is a fair rainfall. He seemed content to work his farm on a 12bush. to 15bush. crop of wheat, with a return of about 15cwts. to 20cwts. of hay. The following year after his visit to the College he bought a drill, and spent about £50 in fertilisers, with a result the same year of 20bush. to 25bush. of wheat to the acre, and from 2 tons to 2½ tons of hay. I asked him had he told his neighbors what he did to get such a crop. His answer was, "No; they saw what I was doing, and that was better than telling them." This year on the Gilbert my brother informed me that his sons had the best crop they ever had. From close on 700 acres they had 25bush. to the acre, from land some of it over forty years in crop. I believe his sons watch the professor as a cat watching a mouse, seeing his crops, and hearing what he has to say. One of them told me when down at the show that it was not so much in the drill and the fertiliser that gave such a grand crop. They now strongly believe in the early fallowing and the constant working of the land, keeping the moisture in the soil and killing all weeds.

I am indebted to Mr. Krichauff, Chairman of the Agricultural Bureau, for a lecture that was delivered by Professor Somerville, of the Agricultural University of Cambridge, in which he says—

"It need excite no surprise that it is the best farmers who give most attention to the results of such experiments and demonstrations. But there are certain farmers whose dignity and reputation are of the order that will not suffer them to set on foot an experimental area or breathe an atmosphere that savors of science. There are others, again, no less practical, who take every advantage of all the teaching that experiment and science have to offer, and it is to the support of these men that agricultural education owes so much."

Then, again, he says—

"No sensible person would ever think of proposing to substitute a theoretical or scientific training in agricultural college for the kind of training that is to be had on a farm. A man can engage in the business of practical agriculture successfully only by mastering it. It is true that he may do so either as a learner on the farm of his father, or of someone else who undertakes the financial responsibility, or, with insufficient knowledge, he may acquire a farm for himself, and gain his experience by the expensive process of a series of blunders."

How true the remarks of Professor Somerville's are only we old settlers know who came here in the early days. How dearly we had to pay for our mistakes! There were plenty in those days who told us what to do and how to do it, but never moved hand or foot to show us practically how it should be done. As you travel by road or train just see how some farmers conduct their farming. What would you call a farmer who leaves his early fallow to a few horses and cows to eat the weeds, and does not use the harrow or the scarifier? What would you call a farmer who fallows late, leaving his land with huge clods till seed time? What would you call a farmer who sows badly-cleaned wheat and expects a clean crop? What would you call a farmer who pickles his wheat with cheap bluestone expecting his wheat to be free from bunt? One would be inclined to call them fools. Such farmers are getting less every year, and well for the country when they are weeded out. As an old farmer of over sixty years, and one who still mingles with the farmers, I can safely say the man who will not adopt proved methods or fall into line with the times is not a practical farmer; but the man who, with an open mind, cultivates not only his paddocks, but his brain, and thinks, is a truly practical farmer. He must succeed, at least in part; he cannot always be a failure if, having the knowledge, he also has the power to use it.

There was no discussion, and the Chairman called upon Mr. C. J. Valentine (Central Bureau), who read the following paper:—

Local Diseases in Cattle.

In this country it may be fairly considered that the object of keeping cattle is to endeavor to make money out of them. There are no men here who raise good cattle for the pleasure of owning them and having them to look at—something beautiful in their paddocks around the homestead. With us it is a plain matter of business, to get as much profit as possible. Raise prime fat animals and cows to give the largest quantity of milk and butter and sell in the highest market. Although it may be inferred that all are anxious to do this, yet many fail,

and from different causes. I intend to deal with only one or two which I consider highly important. First, to excel in the business it is absolutely necessary to keep only good cattle. Your males must be high class if for beef, and of good milking strains if for dairy purposes. Your cows must be selected and their qualities tested; inferior milking cows must be rejected, fattened, and got rid of. There must be a constant and continued endeavor to obtain the best, and no one must be contented because he thinks his animals are superior to those of his neighbors. With both good and inferior cattle there are drawbacks. However fine the animals, they are liable to sickness, and it is on this matter I wish to draw your attention, as stockowners are subject to many losses throughout the country. There is amongst our herds that dread disease about which so much has been heard of late - tuberculosis. On that I am not going to trouble you to-day, but I would say emphatically that with constant care, attention, and a little common sense, in this healthy climate and the surroundings in which our herds are kept, I am convinced that it can be fought, and fought successfully. - Our farmers are losing more from diseases of the digestive organs. Among the sporadic affections to which both cattle and sheep are liable, there are probably none more trying than those which attack the digestive organs and prove so fatal. They frequently exist with others, but are mostly independent affections, Certainly the most serious affections from which so many of the cattle suffer is impaction of the rumen or paunch or of the omasum, and indigestion, too frequently accompanied by inflammation.

Indigestion or dyspepsia is a condition which largely affects cattle in many parts of the country. It is so widespread at times that owners are led to believe there must be some contagious disease in their stock. You will find the whole of the dairy cattle on a farm affected, and milk and condition are seriously depreciated, and deaths occur. Dropping the cud is a marked symptom; animals in prime condition fall off suddenly; a cow in full milk will almost dry off. In dry seasons and long droughts, when the food is innutritious and scarce, animals consume any kind of vegetable growth obtainable. Cattle living through the hard times, when the pastures are freshened by rain and grown luxuriantly, consume large quantities, and disorder follows, causing inflammation in one or more of the compartments of the stomach, and involving more or less the intestines. To this inflammation is ascribed the loss of function, paralysis of the whole digestive track. This is a course which is too often seen amongst our cattle, and frequently results in true gastric inflammation. The treatment should be prompt, and a full drench must be given, which must be followed by stimulants. On the latter I place great importance; but, to be successful, if there is inflammation it must be carefully treated and reduced before recovery can be expected. Now the cause lies undoubtedly in our pastures and feeding. The best grasses have been eaten out, and no attempt has been made to restore them; our cattle are now confined to small areas. Even on virgin lands nothing has been done to secure a return of our native grasses, which all know are highly nutritious. Our farm lands have been cropped for years and years, and it is only during the last few seasons that manures have been used to restore their fertility. What has been done is shown to be highly beneficial from the increased crops that have been raised.

In looking round the dairies from which the milk supplies of Adelaide are drawn you will find few losses arising from diseases of the digestive organs. To produce milk the dairyman knows he must feed his animals on good food, and so it must be with the farmer. If he will keep his animals in good health they must be properly fed—not half starved for six months and stuffed with any sort of food for the other six months. To keep animals in good health they must be supplied with food containing certain salts, which, if not in the pasture or water, must be given. To illustrate this you all know that on many farms the water is quite fresh in dams. There is an instance on record in which a farmer lost a number of his cows. The bones were quite brittle, with swollen joints called “cripples”; and were unthrifty, and good food was thrown away on them. The water was drawn from a fine spring, clear and bright looking. An examination was made, and on chemical analysis no trace of salts could be found. It was like rain water. The cattle were at once removed to another spring, which was found to contain carbonate, sulphate, phosphate of lime and a small proportion of chlorate of magnesia. The change was marked; the animals drank freely, and the worst diseased cows began to improve, and the cattle did better than on the best food they had been previously supplied with. The water supply here is very often from dams and waterholes, fresh, but frequently not too good. Numerous cases have occurred here, on farms where phosphatic manures have been used, on which the cattle are now thriving, and there are no more complaints of sick cows. To keep your cattle in health, to have good milk returns, and fat cattle, they must be supplied with proper food. Salt bonemeal, and sulphate of iron must be given, and lime in fresh water are some of the means by which the want in the pasture can be remedied. I wish particularly to impress on you the value of bonemeal. It can be easily obtained, and in very many instances it is most important that animals should be liberally supplied with it. By far the best course where farming is carried on is to use phosphatic and other manures. Feed your cattle on the food raised by such means. Pasturing cattle on the stubble lands will be found highly beneficial. Take every condition into consideration, and supply the want that has arisen from the destruction of the best grasses and herbage, and from the conditions to which all are more or

less subject—dry seasons and inferior food—and I am certain that the losses of valuable animals will be less and more profit will be derived. The expense of the course suggested will be fully met by the prevention of the loss of valuable cows.

The following mixtures are suggested for administration to sick animals, according to the symptoms exhibited. It must be borne in mind that no one of the prescriptions is useful in every case of disease:—

Drench.—Twelve ounces to 1lb. epsom salts, 2ozs. ground ginger, 2 drams nux vomica, 1lb. to 2lbs. treacle; mix with 2qts. warm linseed tea and administer.

Another Drench.—12ozs. epsom salts, 1oz. gentian, 1oz. ginger, 1oz. carbonate of soda; mix with 1qt. warm linseed tea and administer.

Another Drench.—1lb. to 1½lb. epsom salts, 2ozs. ground ginger, 2ozs. gentian, 1oz. carbonate of soda, 2ozs. sulphur; mix in 1qt. to 2qts. warm linseed tea and administer.

Tonics.—One pint to 2pts. warm ale, 2 drams nux vomica; repeat after six hours three times, or oftener if required.

Another Tonic.—Salt, 10lbs.; sulphate of iron, ½lb.; and 10lbs. to 20lbs. bonemeal. Mix and give a good handful two or three times a week with damped chaff or similar food.

Another Tonic.—Keep a supply of mixture of 20lbs. salt, ½lb. sulphate of iron, and 10lbs. to 20lbs. bonemeal in a trough for animals to lick. Powder the iron sulphate and mix carefully. When the food is very dry damp it with 1lb. to 2lbs. molasses in 1gall. to 2galls. water.

Reservoir or dam water should be served in a trough, into which a little lime should be placed occasionally.

Mr. M. RANKINE said he had heard that “dry bible,” or impaction, was caused by a poisonous plant, and he wished to know if this was correct. He had lost three cows from that disease, and had several sick.

Mr. VALENTINE said “dry bible” is not caused by poisonous plants, but originates in dry, innutritious, fibrous food, and causes acute indigestion amongst other evils.

Hon. J. L. STIRLING had a cow kept in a good paddock, with plenty of water and feed, and yet she apparently suffered from impaction, but the district inspector said the trouble was due to some poisonous weed.

Mr. J. CHERITON said impaction is undoubtedly due to the dry, fibrous, innutritious nature of the herbage during autumn and early winter. The herbage was fed down too closely, and the most nutritious of the grasses and herbs were fed down so closely that they had no opportunity to reproduce by means of seeds, consequently the best of them were exterminated, and only the rough coarse herbage remained in existence. When he had grown hay upon land that had been treated with bonedust, he found that cows would leave everything else for it. A neighbor had every head of cattle suffering from cripples, but after he gave them some bonedust in their drinking water they all recovered their health and got fat.

Professor LOWRIE said indigestion is largely due to injudicious feeding in many cases. Too much stimulating food, forced conditions of living, would contribute to and cause a loss of tone in the system. Farmers should grow some succulent fodder where possible, such as lucerne, sorghum, maize, &c.

The Apple Industry.

Mr. S. H. HENING read the following paper, written by Mr. A. J. HANCOCK, of Mount Compass Branch:—

In this locality, where there is such an area of land suitable for apple-growing, I do not say it is undesirable to graze sheep on it, but why have all your eggs in one basket—why not plant a portion with fruit trees? Apples seem best suited for the soil, and the climate is not far short of perfection. I have been here seven years, and have planted a good portion of my land with apple trees; I have had no previous experience in gardening, but most happy to get what little information I can, and impart any of my own little experience to others. It does not do to stay at home and work out all your own ideas, but get about among others, compare results of different methods of dealing with pruning, cultivation, insect and other pests, and the result will repay you. My trees are not yet in full bearing, but are growing well. What little fruit there is it is of good flavor and good color. Rome Beauty, Rymer, Jonathan, London Pippin, Scarlet Nonpareil seem best suited to this locality. Cleopatras make good growth and bear

well, but are very subject to disease, some of the apples on trees in low-lying ground being badly affected with bitter pit. It is most advisable, when procuring trees from nurserymen, to have them worked on low stems not more than 18in. high, and, after planting out, it is advisable to prune the branches back to two or three buds. This will promote a sturdy, vigorous growth which will, in the first place, give the roots a good start, and also keep the trees low, which will make the work of picking the fruit or the treatment of disease much easier; secondly, it promotes the trees to bear nearer the centre. This year I am rearing my own trees by grafting Northern Spy on to blight-proof roots, and then budding with the variety needed. I would like to know if it is practicable to bud the pieces of wood of the Northern Spy needed for grafting before cutting them off the trees, say, put buds in every 6in.; this would leave plenty of wood for cutting up grafts. My idea is that by this means trees would get a far better start, as there would be no wood to cut off the trees as there is after budding in the accustomed way of rearing young trees.

One great nuisance the fruitgrower has to contend with is the rabbit. They are very numerous here, and it is difficult to keep them in check. Of course in exporting fruit we have to compete with other countries. We must therefore keep up a good standard of quality. All fruit that I have exported has been without blemish, and that necessarily leaves a lot of fruit that some other means must be found to dispose of. Windfalls can be fed to pigs, but for sound fruit some cheap method of evaporating must needs be found. Referring to codlin moth, about which there has been so much discussion, in my opinion the law should be enforced. So far my garden is free from moth. There is one precaution I think necessary: that is not to have empty cases returned, but dispose of fruit and cases. Again, if it were possible for people to purchase apples affected with moth in the Adelaide markets or elsewhere, codlin moth would be widespread through the colony in a very little time. I have heard of instances of people bringing fruit from the city infected with moth. Now, this is a very easy way of spreading the pest, and I think in such cases people should call the fruit inspector's attention to the matter; of course it is, we know, a very difficult matter to get at, but we cannot be too careful.

Mr. F. McKinley has suggested that, in the absence of sufficient wire netting to enclose the whole orchard, each tree could be protected against rabbits by means of wire netting.

Mr. M. RANKINE remarked that, much as he sympathised with those fruit-growers whose orchards are affected by codlin moth, he hoped that no relaxation would be permitted of the regulations prohibiting the sale of infested fruit.

Dairying.

Mr. G. S. THOMSON, Dairy Instructor, was unable to be present, but the following paper, prepared by himself, was read by Mr. MOLINEUX:—

It is pleasing to record the progress made in this State in all branches of the dairying industry. Commendable attention is being devoted to breeds of stock, as evidenced by the high butter-fat percentages in the milk of our cows which figure in factory records. In the past year's reports, received from six factories, the magnificent average of 4.6 per cent. for the month of July is given by one district, while the remaining months are also creditable with percentages of fat varying from 4 to 4.4.

In the case of the first quoted percentage, we find that a pound of butter is manufactured from 19.3lbs. of milk—truly exceptional in factory practice throughout the dairying countries of the world. But it has all along been my opinion that South Australia, with its fine soils, can produce milk results of a maximum standard. The hot climate is severe, but in that severity there exist conditions favorable to plant growth and general quality of milk. With a rich milk, however, we lack in quantity and total yield of butter manufactured throughout the year. Systematic farming, which includes the growing of green food and liberal yet careful feeding, will add to our butter production and health of stock. Attention should be directed to a steady monthly supply of butter, and the marked fluctuations that are experienced at present ought to be of less occurrence in future. By this advance, regularity in the calving of cows throughout the year would be maintained, and the profits realised would warrant the additional labor and expenditure. But it must not be understood that food is the great factor in raising fat percentages in a herd. We must look to breed to attain this object, with the assistance of food to meet the demands of the digestive machinery. Feeding beyond the requirements of a cow, although not general, naturally produces fat, which, unfortunately, is often accompanied with injury to the activity of the milk glands; and during the past year I have known a number of valuable cows to succumb to diseases following calving when the animals were in an overfed or plethoric condition.

Pedigreed Sire.—A desire on the part of the farmer to own a pedigreed sire amongst his stock, and a strong objection to a mongrel bull, will be evidence of a wish to build up a profitable class of milkers. When in possession of a good sire, whether he be milking

Shorthorn, Jersey, or Ayrshire, it is to the interest of the dairy farmer to rear the heifer calves from the best milkers, and to feed and bring them up in health, and with a constitution able to withstand the stress of heavy milking, and, in cases of misfortune, scanty feeding. It is a gain to the profits of the farm to provide shelter for cows, to be accessible either in summer or winter. Undue exposure to heat or cold is not without injury to the milk yield and general health of animals so neglected.

Characteristics of Milk.—In the opening of this paper I have referred to our butter-fat percentages. Now let me say a word in favor of the general characteristics of the milk, which go to the production of choicest butter. The climate and soil of this State are unequalled for the formation of milk possessed with a rich aroma and a high percentage of hard and volatile fats, so essential to the manufacture of a product firm in body, and distinct in that nutty flavor which is prized by judges and appreciated by consumers. Were our cows, on the other hand, dependent on rank and succulent food, the butter would be without that solid consistency capable of being less injured by heat, the flavor would be weak and insipid, and the local and export value would be lowered.

Quality of Butter.—Recently an illustration of the standard of South Australian butter was demonstrated by the high points awarded to the exhibits at the show of the Royal Agricultural Society, when fourteen entries gained at the hands of an able judge points varying from 96 to 99, and at a season of the year not altogether favorable to quality and success. Such an exhibition testified to the ability of the competing managers as reliable and careful men, worthy of every encouragement at the hands of directors and milk and cream suppliers. Let the question be asked, wherein did the defects of their produce lie? In answer to this, the defects in their exhibits were not faults of the makers, as shown in the awards for texture, salting, and packing. Out of a total of 770 points for the above, only 10 were lost, while for flavor 26 were deducted out of a possible of 630 marks. This was more strikingly illustrated two years ago, when Mr. Simpson, of Melbourne, examined sample boxes of butter from eighteen factories after the product had remained under refrigeration from six to eight weeks. After careful examination, the total loss for flavor was 191 points out of 900, whilst for color, texture, salting, and packing only 16 out of 900 was lost, or 1·7 per cent. In his report to the Hon. Minister of Agriculture, Mr. Simpson expressed himself of texture and color as follows:—

"Texture.—This, which actually demonstrates the methods of manufacture adopted, I found to be of the highest standard, and in no single instance did I find cause to reduce the maximum number of points allowed under this heading to any appreciable degree; and it calls for my congratulations to the excellent work displayed by your managers.

"Color.—Here, again, I was pleased, and in the majority of cases found that the so-much-desired tint of 'bright primrose' was predominant, which is almost invariably asked for by the home buyers." In the above instance it was fishiness that reduced the marks for flavor, but in general practice it is from avoidable contamination that we invariably suffer, and I appeal to suppliers to assist the factory managers in not only maintaining a good quantity and quality of milk, but in rigidly enforcing preventive means in order that the supplies may be sent to the factory free from foreign matter and taint. Sanitary laws are neglected in many cases, and, were attention given to this vital element, South Australia would greatly benefit, and would raise herself to a more satisfactory position as a butter-producing country."

Butter Defects.—The defects in our local butter supply are certainly not calculated to impress one that the quality is anything like uniform. Local buttermakers neglect care in cream-ripening. Churning is delayed until a sufficient quantity of cream is collected, when it too frequently happens that the first few collections have passed the degree of ripeness and reached a stage of deterioration hurtful to the whole churning of butter. Care in milking, separating, cream-ripening, and frequent stirring, and churning oftener will help considerably to improve the standard of the manufactured article. Allegiance to cleanliness in every branch and a desire for instruction and information will enable a person to become a trustworthy and reliable buttermaker.

Fishiness.—The search for the cause of this serious defect dates back to two years ago, when I arrived at the conclusion that fishiness can develop at a freezing temperature. In the past extensive scientific and practical investigations carried out by the Department of Agriculture, I commenced with the botanical side, and worked through the veterinary, chemical, and bacteriological stages, and now, after much profit, we have arrived at the refrigerator, where an elaborate series of tests will be conducted during the next six months. What has already been made known in the execution of this work has received the notice of the leading dairy paper in London, with a recommendation to the Department of Agriculture in Ireland favoring the institution of tests organised on similar lines.

Experimental Work.—It is to the experimental work that the butter and cheese maker and dairy farmer owes much benefit, and there is no branch in agriculture where science is more demonstrated than in the work of the dairy. In South Australia we have entered into a field of experimental labor and research in which factory managers and farmers are taking

part. To-day three of our factories are conducting valuable tests to ascertain defects in the manufacture of butter and cheese, and with a view to minimise the losses sustained. Likewise three dairy farmers are carrying on elaborate feeding experiments with mixed rations of food; and, to make their work of much value, the cows undergoing the experiments will have their milk weighed and the butter-fat percentages taken morning and evening for an extended time. During the first week of the investigation feeding will be done in the usual manner, while the remaining period will be allotted to varied rations containing Sunlight oilcake, bran, chaff, molasses, chaff, hay, wheaten hay, along with other foods, given to the cows in a dry and moist condition. Actual weights will be kept of the food for each cow, and the department will have a complete record of the whole work, which will include the prices of the different rations, albumenoid ratio, cost of production of the butter, keeping qualities of the butter, and the melting-point as influenced by the different rations, and many other items of importance will be attached to this valuable experiment. When experimental work becomes general amongst factory managers and farmers, the gain from their combined efforts will be beneficially felt in the State. The managers, many of whom are in the possession of the latest scientific tests used in factory work, will be in a position to co-operate with the farmers, and jointly they will be able to make clear problems hitherto obscure to many connected with the industry. Scientific and practical investigation already done at a few of our factories affords a grand promise of what must follow. In the cheese-making branch I will be able to show a very valuable report on cheese manufacture, with results of all modern tests appended, from the percentage of fat in the milk down to the analyses of fat in the green and matured cheeses. Complete acidity and other records showing losses in manufacture will be recorded. Those cheeses will be finally examined by experts in England and Scotland, and their reports sent to the department. I may mention that the most of the above work will be done by dairy students who have passed through a course of study, and have been awarded one or other of the certificates granted by the department.

With a continuation of dairy instruction in the schools in town and country, and the able help from the *Journal of Agriculture*, we ought to be in a position to hold our own in the world's markets, and, lastly, I trust that the farmers will come forward and enter into every branch of duty calculated to advance our industry.

Mr. H. KELLY remarked upon the advances made in scientific dairying recently. Mr. Crowe, of Victoria, came over to act as judge of butter at the late Royal Agricultural Show in Adelaide, and he had met him at the railway station, and accompanied him directly to the Show. He went straight on to the exhibits of butter, and, after going over them several times—no one else coming near him—he came to the stewards and said, "Numbers so-and-so" (mentioning two or three exhibits) "were made by one person, and numbers so-and-so were made by another person." This he did in several cases. This wonderful discrimination was due to his acute senses of taste, smell, and sight.

Mr. G. JEFFREY said these perceptive faculties were the proper qualifications of a judge of dairy products, and he was sure that Mr. Thomson, if placed as a judge, would have shown equally acute perception in smell, taste, and power of observation.

Mr. M. RANKINE wished to know why the prizes were always allotted, at the shows held during March, to butters made in the hilly districts.

Mr. VALENTINE said the feed was scarce and dry on the lower country during summer and autumn, and there was usually a fair amount of green feed amongst the hills at that time, and this would account for the fact that the hills butter is then of better quality than that produced on the plains. Other speakers confirmed that opinion.

Wool.

Mr. G. JEFFREY, Wool Instructor, was on the agenda for an address upon "Wool," but said that, as he had to lecture very shortly at Strathalbyn on the same subject, he had better leave the matter until then. He summarised shortly the remarks he had already made at Gladstone, Quorn, and Mannum Conferences.

Several members disagreed with Mr. Jeffrey's recommendation of the strong-framed Merino for farmers, and would prefer certain crossbreds, on account of greater weight of lambs for export, more mutton for local markets, and heavier fleeces of wool.

Farming in South Australia.

Professor W. LOWRIE, M.A., B.Sc., Principal of the Roseworthy Agricultural College, then gave a lengthy and interesting address to the following effect:—

The Agricultural College Farm now had to be self-supporting. In former years it had been suggested that the Government purse was behind the institution, and that therefore the confidence of the farmers in it had been destroyed. But now the only money spent on the farm was the money earned off it. (Applause.) He was satisfied that valuable experiments had been, and were being, conducted at the college. The other day one member of the Central Bureau complained that he was devoting too much of his time to the drudgery of a farmer's life, and not sufficient to pure science. (A delegate—"Absolute rubbish.") A very few years ago the boot was on the other leg. They could turn up *Hansard* and find that complaints were made that he was doing too much theoretical work, and not enough practical. As a matter of fact he had done no purely scientific work since he had been principal of the college, simply because the necessary facilities and money had not been provided. His work was to teach the business of farming. (Hear, hear.) He would very much prefer the drudgery of a farmer's life to filling up dockets or working briefs in an office. The Central Bureau should endeavor to make it widely known that farming was a business, or even a profession, which required as keen business abilities as any of the professions which so many people flocked around in town. (Hear, hear.)

Mr. Molineux—Only one member of the Bureau made the remark you complain of. The Central Bureau is not responsible for the utterances of individual members. The same person stated that the Bureau had been in existence for thirteen years, and had done nothing but talk.

Professor Lowrie—The members should not have allowed the remark to go unchallenged.

Mr. Molineux—I wish you had been there.

Professor Lowrie wished that he had been present. If he had known that he was to receive so much personal attention from certain members he would have been there more frequently, and held up his hand in a way which they might not have anticipated. (Hear, hear.) For several years he had been experimenting in the cross-fertilisation of wheats. He had had under his notice at least 150 cross wheats, and had narrowed them down to four, although there might be hope for one or two others. He was not satisfied yet that they were good wheats, and therefore he had not published or talked about the results; therefore certain members of the Bureau had come to the conclusion that he was doing nothing, whilst Mr. Marshall had written to the press and spoken of him as a dog in the manger. That was rather hard, seeing that it was not so long ago that he showed Mr. Marshall how to cross wheat. (Laughter.)

Professor Lowrie then explained in detail the results of the latest experiments made at Roseworthy in the use of artificial manures, being assisted by half a dozen large charts setting out in comparison the names and quantities of the various manures used, together with the yields and monetary gains. He added that where the rainfall was large less soluble manures could be employed with advantage. In the hills bonedust would prove more profitable than on the plains, but where the annual rainfall was only 15in. or 16in. the use of more soluble manures was necessary. Why did so many farmers persist in putting on only a little dressing when with increased dressings there was a regular upward progression in yields and profits? An opinion prevailed with many people, including the Premier of the State, that too much super. had been used on a large area of land; but, as a matter of fact, every grain of manure was of value. In spite of the practical demonstrations which had come from the Agricultural College, many farmers still used only 70lbs. of manure to the acre. He allowed that modifications in different districts might be necessary, but generally it was much more profitable to apply a fair dressing—say 2cwt. to the acre—than a light one, and it paid better to use more soluble phosphates than any other kind of manure. He advocated heavy dressing, but even 1cwt. to the acre was better than none at all. When the land was intelligently and sufficiently worked—and that time was rapidly coming—and when the results from wheat were backed up by nice little flocks of sheep on every farm over a large part of the State, and by herds of dairy cows in the more favored districts, they would be coming nearer to the capacity of South Australia. (Hear, hear.) At present they were a long way from it. He pointed out the terrible loss the State was suffering through the neglect of the farmers to keep sheep. (Hear, hear.) The stubble on land which had been manured kept sheep so much better, and the herbage came so much earlier. The land would carry half as much stock again—in fact, his experience was that it would carry double. Now that they had the openings for shipping lambs they could not afford to neglect the land altogether. (Cheers.)

"Prevention is Better than Cure."

The GENERAL SECRETARY read the following:—

What a pity it is that we all do not recognise the eternal truths that are embodied in the proverbs, "Prevention is better than cure," and "A stitch in time saves nine." The losses and waste occasioned by various introduced pests could have been avoided by a vigilant attention to the

first axiom, or a zealous enforcement of the second whenever it has been found that the enemy has gained an entrance, despite the precautions to exclude it. It may be a bold assertion to make, but careful thought will perhaps lead to the admission of its truth by a great majority of our agronomical population that the losses annually suffered by them through the ravages of introduced pests and diseases, and the absence of adequate preventive and early curative measures, amounts to quite 30 per cent. of their total income.

Locusts, although indigenous, could be dealt with, by united action, so that their mischievous ravages could be considerably minimised. In South Africa, where summer and autumn rains contribute a good deal of moisture to the air, a culture of a peculiar mould or fungus has been found to be effective; but whenever the atmosphere is dry, this fungus is of no use. In the adjacent State of Victoria, our neighbors have tried the same fungus, but were successful only when rain had fallen just previously and humid conditions prevailed for a few days afterwards. Under these circumstances, it would be almost hopeless to try and cope with locusts in our dry north, by using locust fungus. But Cape Colonists have an equally effective agent in arsenic dissolved with soda, mixed with sugar, and sprinkled on the herbage near to where the locusts congregate; or the poison is sprinkled on chaffed maize or any other vegetable matter. This poison is so attractive that the locusts come from all directions within 30 yds., eat of it, die, and are eaten by other locusts, which also die and are entombed in the same manner. Locusts of all sizes and ages are thus attracted, but the poison is most destructive when used against the newly-hatched insects. They then congregate in flocks, sometimes covering only a yard or so of soil, and, occasionally occupy perhaps half an acre of surface. A very little poison then goes a long way in killing millions of them. Whilst in the hopping stage, the locusts can travel only very short distances; but whilst growing, until winged, they are most voracious, and do a deal of damage. Therefore, if all occupiers in the neighborhood of locust-infested land were to combine and distribute poison, as above indicated, the number of adult flying locusts would be enormously diminished, and the damage by the young locusts prevented.

As an instance of what may be effected by prompt action when a pest is first detected, the work done by the Mount Gambier Branch of the Agricultural Bureau should be mentioned. The so-called Canada thistle (*Cnicus arvensis*), or English meadow thistle, was found on a small patch of land at Compton Downs. The owner of the land would do nothing for its extermination, and there were no means of compelling him to do so. The thistle was known to be most difficult to deal with, and likely to ruin the whole of the arable land in the district if left to nature, so the members of the Bureau obtained consent from the landowner to deal with it; and they spent a deal of money, and for about four years they used unceasing but effective efforts to eradicate it. By their patriotic action the members of that Branch saved that part of the State an annual loss of many thousands of pounds.

Seemingly oppressive and cruel measures adopted by the health boards have from time to time prevented the introduction of diseases which, if they had gained a footing here, would have possibly decimated our population; and the drastic measures followed when unfortunately some such diseases as bubonic plague, smallpox, &c., have gained an entrance, despite the vigilance of those active officers, have so far been successful in stamping them out before much mischief has been wrought. There are people who object strongly to the maintenance of officers for the protection of life and property—more especially when the duties of those officers affect their personal interests or touch their pockets; but let anything arise where the absence of such preventive officers affects their interests, then they will make noise enough with an opposite intention.

Many of us remember the fearful storm of opposition and indignation that was raised by the passing of the Scab in Sheep Act. Fortunately the Act was vigorously and fearlessly enforced by competent and zealous officers, and the microscopic mite, which was said to "infest every post and stone throughout Australia," was completely exterminated. Australasian pastoralists are of one mind now in respect to the practicability of dealing with scab, and it is a great pity that our horticulturists have not arrived at the same happy conclusion with respect to codlin moth and other pests.

What a tremendous annual loss could have been avoided had restrictive measures been adopted a few years ago in respect to the importation of plums and other fruit in codlin-moth-infested cases, and how easily could it have been stamped out during the first two years after it had been so introduced. Now there is but one effective remedy, and that one so drastic and heroic as to appal the stoutest heart. Yet it would be better to adopt that remedy at once, and prevent the annual loss sustained by the continued existence of the pest. The caterpillars cannot exist without fruit to sustain their life, and if all fruits were at once gathered when just formed the moth would cease to trouble us until re-introduced. If this drastic remedy is not adopted—and I have no expectation that any large majority of our fruitgrowers can be educated up to that point—we must depend upon spraying arsenical compounds (which save up to 96 per cent. of the apples and pears in many orchards in America) and upon bandages, gathering of affected fruit, and various other laborious and costly operations.

Had Australians been wiser, or better informed, they would have arisen as one man against the first rabbits, hares, sparrows, foxes, goldfinches, starlings, snails, and numerous other pests

that have been introduced from other countries. But we were sentimental, and hailed with pleasure the harbingers of our ruin. They increased rapidly, and when they began to become pests in the first centres of their occupation, and complaints were made of their ravages, no alarm was created in localities that were unaffected, and no remedial or preventive measures were adopted until in certain cases the pests had become so widely and numerously disseminated that it was practically impossible to cope with them. Even when legislation was resorted to, when Acts were passed, and municipal corporations and district councils were empowered to adopt active measures for suppression, there were not a few of such bodies who either neglected or absolutely refused to put the Acts into operation, whilst adjacent corporate bodies were doing everything possible to eradicate noxious weeds or to destroy pestiferous birds, &c. Numerous instances have been given, too, where local justices have been most reluctant to convict offenders when charged by district councils with neglect or refusal to obey instructions to deal with noxious weeds, or rabbits, or other pests; and in some cases, where it has been impossible to avoid convictions, the justices have imposed the minimum penalty, reduced to a merely nominal fine, and have adjudged the complaining council to pay the costs of the action.

Through neglect of rational precautions we have annual bush and grass fires, destroying many valuable human lives, rendering hundreds of industrious families homeless and destitute, burning great numbers of live stock, and destroying crops, grass, fences, and everything else, over thousands of acres of land. Fires will certainly occur, through negligence and other causes, but why should they be allowed to extend over such large areas, and cause such awful, but preventable, damage? Surely it should be possible to feed down the grass, or otherwise to denude the land of combustible matters, over sufficiently wide strips to confine the devastation to limited areas. Is it a sufficient protection to plough two or three furrows between a railway line and a heavily-grassed dry paddock? Would it be possible to prevent "accidents" in such a locality by feeding bare three chains next to the line? If so, similar practice might be adopted in other places. Cross breaks could be cleared, by stock or otherwise wherever there is possibility of disastrous fires. Where these should be made ought to be arranged each year before the middle of August, and the firebreaks should be completed before the end of that month. If necessity arises, any loss or damage to the owners or occupiers of the lands used as firebreaks should be defrayed by the whole district protected thereby.

Where necessary it is imperative that our producers shall co-operate for the general good. In all matters affecting the community as a whole the duty of attending to it belongs to the Government or the local governing body; but where the interests of a section of the community are involved, that section must act in concert, and vigorously too. Such co-operation would be justified in insisting upon the enforcement of all laws and regulations for prevention of the introduction of pests and diseases of every kind; for the adoption of all reasonable measures for control, suppression, or extinction of any pests, diseases, or other damaging agencies that may exist, or be liable to exist; and, if they will go much further in co-operation for the advancement of the general or individual welfare, they can do much good and no harm.

The only remarks made were in respect to bare fceeing of land next to boundaries, which all were agreed is not practicable, except that the sheep would tread the grass down. In timbered country and scrub the fire will be carried in leaps of over a quarter of a mile.

Conclusion.

A comprehensive vote of thanks to those who had contributed papers, and to others who had assisted in carrying out the Conference, closed the session.

CHERRY GARDENS BRANCH EXHIBITION.

The annual Show under the auspices of the Cherry Gardens Branch of the Agricultural Bureau was holden on March 21. The weather was cold and showery, but there was a good attendance of visitors. The collection of home industries staged by Mrs. Thos. Jacobs was extensive and of great merit, and that of Mr. J. Lewis was very good indeed. The exhibits of apples were numerous and of excellent quality. Butter was staged by a good number, and potatoes and onions were plentiful and of excellent quality. Fodder plants were not as plentiful or as good as usual at these shows, owing to the season. The same remark applies to the vegetables generally, except potatoes and onions. The children's home and school work was excellent, as usual.

BRANCH SHOW AT APPILA-YARROWIE.

The first show under this Branch of the Agricultural Bureau was held in the public hall at Appila-Yarrowie on February 26th. Considering the locality and the drought that had prevailed there was a very fair show. Wheats were put in by Messrs. Catford, Bottrall, and Brinkworth. Pears, peaches, grapes, dried and preserved fruits (locally grown) were staged by Mrs. J. M. Grant and Mr. P. Lawson; jams and jellies, by Mesdames Mayer and P. Martin; and a good collection of apples, currants, and other dried fruits by Mrs. Waters, of Angaston. Mesdames J. M. Grant and Francis received special prizes for jams, and Mrs. J. Wilsdon for marmalade. There were the usual exhibits of fodders, chaff, wheats, butter, eggs, flowers, needlework, &c.; but there was a remarkable absence of many items that would naturally be expected to be present on the tables at a country show.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, MARCH 18, 1901.

Present—Mr. F. E. H. W. Krichauff (Chairman), Hon. A. W. Sandford, M.L.C., Messrs. W. C. Grashy, Thos. Hardy, M. Holtze, R. Homburg, M.P., J. Miller, M.P., H. Kelly, T. B. Robson, C. J. Valentine, and A. Molineux (Secretary).

South-Eastern Conference.

Penola Branch intimated that the Annual Conference of South-Eastern Branches would be held on April 24.

Alleged Injury from Manures.

The CHAIRMAN said that last October there appeared in the daily papers a statement by the Premier, Hon. F. W. Holder, that he regretted to notice during his trip through the North that a large number of wheat crops had been blighted by the hot winds, and that the blighting was worst where the most manure had been applied. He had at once asked Mr. Holder for particulars concerning the crops alleged to have been affected, and had recently received a reply to the effect that from the information gathered during his trip he had formed the opinion that the blighting off of certain crops near Spalding and the Burra was due to the excessive use of fertilisers. He had himself noticed that the blighting over considerable areas was always on land with a north or north-eastern aspect, and always where the drill had been used. The Chairman stated that he had written to several Branches in the localities indicated, and had received a reply from the Hon. Secretary, Burra Branch, who intimated that they had heard no complaints in their district of injury through excessive use of manures. One of the crops specially referred to by the Premier was certainly blighted on a narrow strip, portion of an alluvial flat, where a lot of rubbish from the road had gathered. On this land 1cwt. per acre of Thomas phosphate was applied with the seed, and, although the crop looked badly blighted in October, a ton of hay per acre was cut from it.

Mr. HOLTZE agreed that an excess of manure or water even would render any crop very susceptible to hot winds during a dry spell, but judicious use of fertilisers could not be injurious.

Mr. MILLER said they had frequent evidence that crops of luxurious growth on ground that had not been manured suffered during dry spells.

Members generally agreed that the application of 1cwt. to 1½cwt. of phosphatic fertiliser per acre could not be regarded as excessive or likely to have an injurious effect on the crops during hot weather. Regret was expressed at the prominence given to the statement of the alleged injurious effect of the manure.

Exhibits.

The CHAIRMAN tabled seeds of the Syrian Wild Grape, which were distributed to members for trial.

Mr. GRASBY showed photo. of Grenache vine, very heavily laden with fruit. This was a fair average of a large number of vines at Penfold Vineyard. Mr. Gillard estimated that many of the vines would yield two cases of fruit.

Improvement of Wheats.

Mr. KELLY referred to work done by R. Marshall in regard to the improvement of the milling qualities of our wheats. He thought something should be done to help Mr. Marshall to continue his work, and the Bureau might well take the matter up. He was sorry to hear from Mr. Marshall that he did not wish to carry his work on, but wanted the department to take it up.

Mr. GRASBY agreed with Mr. Kelly. He was much impressed by the work done by Mr. Marshall, who was entitled to all credit and respect for what he had done in the past. The work he had taken up was deserving of every encouragement, and he regretted that Professor Lowrie and Mr. Marshall were not altogether in accord as to the best means of improving the quality and reputation of our wheat. He thought the matter should be taken up by the Bureau, and he moved—"That a committee, consisting of Professor Lowrie, Messrs. F. Krichauff, H. Kelly, R. Homburg, J. Miller, and the mover, be appointed to consider the question of the improvement of our wheat, with a view of taking united action with the corn trade section of the Chamber of Commerce." This was seconded by Mr. Hardy, and carried.

Mr. MILLER regretted that the small testing mill obtained a few years ago had never been put up. It would save much loss if all new wheats could be tested early. It would be of great advantage to the farmers if they could ascertain whether any new wheats raised by themselves or offered for sale were good milling wheats.

Mr. HOMBURG thought, if this work were necessary, Professor Lowrie was the man to do it. The farmers themselves should be the best judges of what were the best wheats to grow.

Mr. HOLTZE said several years ago he was asked by Mr. M. Kahlbaum, who supplied him with seeds of several new wheats, to take up the crossing and selection of wheat, with a view to obtaining improved varieties. A considerable amount of work has been done, the object being to secure a wheat that was early, of good milling character, a good yielder, and without the liability to shell, so common with early wheats. He had by this crossing and selection obtained several promising wheats, one of which Mr. Kahlbaum was very pleased with. It would of course require to be "fixed" by continued selection, which would take several years.

Professor Lowrie.

Mr. HOMBURG said that on several occasions, at the Central Bureau meetings and elsewhere, it had been stated by the General Secretary and others that Professor Lowrie had no time to do certain work, including writing articles for the *Journal of Agriculture*, owing to the numerous duties he had to perform in connection with the Roseworthy College and Farm. He thought it was a great pity if a man of the professor's attainments should be compelled to devote so much time to what might almost be termed drudgery in connection with the college and farm that he was unable to attend to other important work, including scientific research. He thought there was a lot of work that could be taken off the professor's shoulders, without his in any way losing control of and interfering with the important work carried on at the college. He

considered that if the statements referred to were correct the Bureau should take some definite action to alter this state of affairs, and he would personally be glad to help as much as possible.

Mr. Homburg's remarks were generally approved of, but the Chairman pointed out that the practical work of the farm was most highly valued by the farmers of the colony, who would not appreciate any sacrifice of this for purely scientific work.

Illustrations of Destructive Insects.

Mr. HOMBURG tabled book of colored illustrations of destructive insects, which had been prepared for use in the Victorian public schools. He thought the Bureau might urge on the Government the advisableness of purchasing some for use in our public schools. It seemed to him important that our children should be taught what insects were injurious and what beneficial, so that the former might be destroyed and the latter protected. Very many beneficial insects were destroyed, not only by children, but by adults, in ignorance of their true character.

Mr. HOLTZE agreed. In Germany considerable attention was given to this matter, and splendid illustrations of the various injurious insects were hung up in the schools. He thought something similar might be done here.

New Members.

The following gentlemen were approved of as members of the undermentioned Branches:—Crystal Brook, Mr. F. E. Fischer; Clare, Mr. R. F. S. Martin; Forest Range, Mr. A. S. Gunning; Kapunda, Mr. B. R. Banyer; Strathalbyn, Mr. J. H. Meikle; Quorn, Messrs. Geo. Walker and Heinrich Altmann; Renmark, Messrs. C. R. Rose, F. Turner, and H. Olorenshaw; Morgan, Mr. W. G. F. Plummer; Inkerman, Mr. A. Toza; Hute, Messrs. D. McEvoy and S. Trengove; Penola, Mr. R. Rymill.

Reports by Branches.

The SECRETARY reported receipt, since previous meeting, of sixty reports of Branch meetings.

REPORTS BY BRANCHES.

Clare, February 8.

Present—Messrs. W. Kelly (chair), W. Kimber, J. Treleaven, R. E. H. Hope, S. Bray, H. Carter, H. J. Yelland, (Hon. Sec.), and one visitor.

OLIVE CULTURE.—The Chairman read the following paper:—

My sole aim in calling the attention of this Bureau to the above industry is to create such interest in it as will lead to the extended cultivation of the olive—not in this district only, but in various parts of the State. The climate is favorable for the growth of the olive, and in the middle and southern districts the average rainfall will give sufficient moisture to properly mature the fruit. Seedling and other inferior varieties that are being grown in our neighborhood have produced the general impression that it would not pay to cultivate the olive for commercial purposes. So little has been done in the way of olive culture in South Australia that the would-be grower here would have to rely upon his own resources, and to acquire knowledge by years of practical experience. Travellers who have visited European olive groves and interested themselves in the methods of culture there, as also the processes employed in preparing the oil for market, have, as a rule, been disappointed. In many places in Europe, where the olive has been grown for centuries, comparatively little effort has been made in the way of improvement, either in the cultivation of the soil, the system of pruning, the methods of gathering the fruit or in its manufacture. To obtain useful information in all the branches of the olive industry the learner should not look for it in Italy, Spain, Portugal, or other European centres, where old methods are in vogue, but to new fields of enterprise, where there are no great-grandfathers systems to hamper the hand or the brain. I think I am correct in stating that California takes

the lead at the present time in olive culture. The growers in that go-ahead country have experimented with the olive in different soils, and with the most approved varieties, and in the manufacture of the fruit the very best machinery is used. The California State Board of Horticulture takes an active interest in all that pertains to olive cultivation, and it circulates periodically a vast amount of valuable information.

An important convention, in accordance with a call from the State Board, was held in San Francisco in 1893. This was the third olive growers' convention, and it is reported that the greatest interest was manifested in the proceedings; and the matters discussed cannot fail to be helpful to South Australians who wish to cultivate the olive. Their first business should be to obtain reports and addresses given by practical olive growers in California, and to whet the appetite for such information I purpose in this brief paper to give a few extracts. Arthur P. Hayne, of Santa Barbara, said, "As things stand to-day, the Californian olive grower is far ahead of the European engaged in the same pursuit. As I travelled from region to region, and from country to country, I became satisfied that even if we have had but a few years of experience to offset Europe's tens of centuries, we really know more about olive-growing and oil-making than they do." One would naturally expect that in the old olive groves proper attention would be given to the cultivation of the soil. The same authority has but a poor opinion of the system adopted by the bulk of European olive growers in preparing the soil. He says "All along the Riviera of France and the Italian coast you see here and there a half-dressed peasant with a pick lazily grubbing away at the dry ground, or dozing in the shade of a 35ft. tree. Should you ask him about the best way to cultivate an olive tree, he proudly tells you that there is but one way, and that the way he is doing it is the only way."

Were we to refer simply to defective methods of olive cultivation little benefit would be derived. What is needed is something practical and helpful, and hence we turn to California for the information we require. Mr. J. L. Howland, of Pomona, says—"After two years of careful experimenting with the different olives, for bearing quality and percentage of oil, I find them as follows:—My trees were planted five years ago, and were two years old when planted. The Pendulina, Oblonga, Uvaria, Columella, Rubra, Regalis, and Precox commenced to bear the second year, and have borne steady crops ever since. My Rubra and Pendulina trees averaged a gallon of oil to the tree last season of the very first quality. The Uvaria, Oblonga, and Pendulina trees are the most even ripeners, so that all the fruit on the tree can be gathered at one picking." Mr. Goodrich, another California grower, has found the Correggiolo the best variety to be grown on all conditions of soils. It is one of the best known varieties of Italy, and especially of Lucca. In addition to the above favorite, Mr. Goodrich says that he is "grafting largely the Moraiolo and the Grossajo." Mr. Kimbal, National City, Commissioner for the State at large, gives his experience as an olive-grower—"I have," he says, "tried a dozen varieties of olives, and have had no success that satisfied me except with the Mission; none that were constant bearers, none that carry out the differences given in the books for size of fruit or quantity of oil, but particularly in their ability to produce fruit: I have found nothing that compares to the Mission, and am raising no others, except a few trees of other varieties to experiment with." In answer to questions, Mr. Kimball said—"The reason why some do not get olives is, the trees are starved, if want of water can be called starvation. For lack of water the soil cannot furnish the material from which the olive is made. I have seen trees which were able to and did bear 15galls. of fine fruit, while 50ft. from them there were other olive trees of the same size and age, and in which every physical and natural condition was the same, that did not produce 15qts." He attributed the cause to want of water, and says, "If moisture is not there, it must be put there. I would not plant an olive orchard in San Diego County unless I had water with which to irrigate it. In Santa Barbara County the rainfall is more than three times what it is with us, the average being 9-9in., and sometimes this rainfall is not properly distributed so as to be of use to the planter." A member of the Convention is reported to have said, "I have an orchard within sixteen miles of the bay, in San Diego County, five years old, and we use no irrigation, and I think the rainfall is less than 10in." He had olive trees five years old, the tallest were probably 15ft., the average about 12ft. The soil was heavy and a long distance from water, but he saw no necessity for irrigation. Mr. Hayne, on being asked the method for picking the olive for oil in the olive countries he had visited, was, we think, somewhat sarcastic in his reply. He said, "When they get ready to pick they go out with long poles and beat the trees, without special reference to the olives, but giving the tree a thorough thrashing, and when they cannot see any more on the tree they stoop down and pick them up, after having walked over them all the day. Sometimes they put a cloth underneath, but as a rule they pick them right off the ground." Mr. Howland, of California, says, "The way I pick is simply to spread a canvas with a slit in it around the tree, then the limbs are held with one hand, while with the other the berries are stripped off, and let fall on to the canvas." In planting olive trees for a permanent orchard the quality of the soil should be taken into consideration, as also the variety to be planted, hence we would advise from 20ft to 30ft. I have not grown the olive for commercial purposes, but simply for shelter and ornament. I find that it is a hardy tree and thrives in almost any kind of soil, and believing it may be cultivated with profit. I have culled the foregoing hints in the hope that they may be of some little benefit, or, at least, provoke profitable discussion.

Rhine Villa, March 2.

Present—Messrs. G. A. Payne (chair), H. Mickan, F. F. Payne, H. W. Payne, and J. Vigar (Hon. Sec.).

Ploughs.—Mr. Mickan described a new five-furrow stump-jumping plough which he had constructed. He explained where it differed from other makes, and invited members to attend a trial of the implement.

Bowhill, March 2.

Present—Messrs. E. P. Weyland (chair), F. H. Baker, J. McGlashan, and F. A. Groth (Hon. Sec.).

FOWL DISEASE.—Chairman said some of his fowls became lame, and weak, had swollen head and eyes, and sometimes went blind, whilst the comb became congested and purplish.

OAT-GROWING.—Mr. F. Baker advised all farmers to grow some oats if their soil and climate is suitable, especially where horse-feed is scarce. Oats do well on a poor sandy soil, where the crop is usually two or three times heavier than wheat crops. On new mallee land they pay to grow in order to secure a good bush to destroy the mallee shoots, which cannot be done with wheat stubble. Oat stubble is better than some sorts of hay for feeding stock, and oat grain is excellent for pigs, poultry, and all classes of farm stock. A bushel of oats—40lbs.—at 1s. 4d., is equal in value to a bushel of wheat—60lbs.—at 2s., and a bushel of oats is equal in feeding value to 50lbs. of bran and pollard. Oats will not overrun the land if it is left out of cropping for a year or two, as the stock will keep the plants down. Oats should be boiled before feeding to the stock to prevent the land being fouled, and the water in which the grain is boiled should be mixed with cocky chaff whilst boiling.

Gumeracha, March 5.

Present—Messrs. D. Hanna (chair), J. Monfries, W. W. Nosworthy, H. J. Krawar, A. Moore, Dr. J. R. Stephens, and T. W. Martin (Hon. Sec.).

HOMESTEAD MEETING.—Members met at Captain Randall's house, where they inspected the orchard and various interesting objects.

DAIRY STOCK.—Mr. H. W. Nosworthy read a paper on "The Most Suitable Breed of Cattle for Dairy Stock in this District." He advocated a cross between the Jersey bull and Durham, or "shorthorn" cow. Members generally agreed with him.

Nantawarra, March 2.

Present—Messrs. E. J. Herbert (chair), A. J. Spencer, A. L. Greenshields, S. Sleep, A. F. Herbert, R. Uppill, G. Belling, and T. Dixon (Hon. Sec.).

PROLIFIC WHEAT AND BARLEY PLANTS.—Mr. Sleep said he had seen, upon extra favored spots, wheat that had stooled to the extent of 200 stems from one seed, and one grain of barley had produced 100 stems. This led him to inquire if it would be possible to extend the tillering nature of our cereals by selecting and re-selecting the seed. If so, by thin sowing farmers would save a lot of seed and reap larger crops. Anyhow, he felt certain that good result would be secured by greater care being devoted to the seed. The Chairman thought these great tillerings were caused by very rich soil in sheltered positions. He

felt that it was impossible to devote too much care to the selection and preparation of seed. Mr. Greenshields had noticed that cereals were extremely prolific where sand and ashes had been deposited. On one side of a paddock he had noticed a considerable number of plants that had produced sixty to seventy heads. Mr. Belling did not think it would pay to sow thinly, because some wheat plants under exceptionally favorable conditions produced a large number of heads. A neighbor had sowed as little as 15lbs. of seed per acre, but the returns did not compare favorably with others where more seed was used. The Hon. Secretary advocated the use of a medium quantity of seed. It was only by getting a good average return, year by year, that farmers were successful. Thin sowing might be right in some seasons, but he thought it unsafe to adopt as a general rule. He had seen 150 stems from one seed, but they did not all produce full ears.

GRASS CATERPILLARS.—Mr. E. J. Herbert tabled some caterpillars. They now covered and had destroyed the grass on thirty-three acres. They burrowed about 4in. into the soil, and lined their tunnels with a fine silken web.

Lucindale, March 2.

Present—Messrs. E. Feurcheerd (chair), S. Tavender, J. Riddoch, G. E. Newman, A. Matheson, W. Dow, A. Carmichael, E. Hall, G. A. Humphries, and W. E. Dutton (Hon. Sec.).

OFFICERS—The Chairman and Hon. Secretary were thanked and re-elected.

IMPACTION.—Mr. Hall mentioned that two cows had died in the district from impaction of the “bibles,” and he had been told that bonemeal fed with bran mash was a preventive. [It has been stated that where bonemeal, super., and other phosphatic manures have been used on paddocks the cattle leave all other forage to graze on the stubbles or herbage on such paddocks. It has often been stated that very fine bonedust mixed with bran mash is beneficial in curing, and in preventing, impaction.—GEN. SEC.] Mr. Tavender said he had saved a cow by drenching with common table salt dissolved in water, and she was fat this season.

PICKLING SEED WHEAT.—Mr. W. Dow said he had been very successful in preventing bunt in his wheat crops. He had made a trough 21in. wide, 16in. deep, and 12ft. long. Into this he put 35galls. water, and dissolved 7lbs. bluestone in another vessel. This was equal to 1lb. bluestone in 5galls. water. Mix the solution with the water in the trough. He made four parcels of 1bush. each, soaked them in the pickle for fifteen minutes whilst other four bags were being got ready. When the seed has soaked fifteen minutes take it out of the pickle and place on sheets of iron at end of trough to drain the surplus pickle back into the trough. By pickling the bags any stray bunt spores will be killed, and the mice will not gnaw through for grain.

Holder, March 2.

Present—Messrs. J. Rowe (chair), J. Green, H. Blizard, E. Jaeschke, H. Vaughan, John J. Odgers (Hon. Sec.), and one visitor.

EXHIBITS.—Mr. Green tabled samples of onions. Small Brown Spanish were watered once, and were not manured; larger Brown Spanish, good marketable sample, had one watering, and were fertilised with wood ashes; James' Long-keeping were firm and mild, were the best of the three samples, had no watering, but were fertilised with wood ashes.

Forest Range, March 7.

Present—Messrs. J. Sharpe (chair), J. G. Rogers, C. Stafford, W. Cherryman,* Job Rowley J. C. Jennings, J. Vickers, R. Townsend, and J. Caldwell (Hon. Sec.).

OFFICERS.—Mr. Job Rowley was elected Chairman.

EXPORT OF APPLES.—Mr. Townsend proposed to visit England by next mail, and promised to attend the sales of South Australian apples in the London market, where he hoped to pick up information which will be useful to exporters.

Boothby, March 5.

Present—Messrs. J. T. Whyte (chair), H. S. Robinson, T. Sims, E. Bradley, A. Rob, J. Bell, and R. Carn (Hon. Sec.).

SEEDING.—After discussion members decided that the present time is too early for sowing cereals in this locality.

STALLION.—Correspondence between Bowhill and Boothby Branches considered with respect to co-operation in purchase of a Clydesdale entire horse.

Port Pirie, March 2.

Present—Messrs. E. J. Hector (chair), T. Johns, J. Lawrie, W. Williams, T. Gambrell, F. Humphris, T. Jose, G. Hannan, and T. A. Wilson (Hon. Sec.).

CATTLE COMPLAINT.—Mr. Hannan said some of his young cattle became stiff in the legs, were unable to walk, lost their appetite, but recovered after several days. Other members had noticed the same symptoms in cattle and in sheep, and most of them thought the animals had eaten some poisonous substance. An effective remedy had been found in carbonate of soda—for a sheep, one teaspoonful in half a pint of water; for cattle, a tablespoonful in a pint and half of water.

EXPERIMENTS.—Mr T. Johns drilled in 300 acres of wheat and hay crops. On a portion he also drilled 5 tons mineral super. at the rate of 80lbs. per acre, and he was much satisfied with the result. The increase in yield was quite 4bush. per acre, and was as good on newly-ploughed land as upon fallow. Carmichael's Eclipse wheat gave the best results, and had he sown none other he would have had 100 bags more of grain. It was early, stood up well, and did not shake out; it was hard to thrash except in a damp-weather stripper, owing to its weak backbone. Baroota Wonder was next best, but shook out when ripe, and made the best hay of the lot tried. Dart's Imperial was late, and did well. Six bushels sown on ten acres gave 6 tons hay and fifty-two bags wheat. Gluyas went down, was very hard to thrash, not a good milling wheat, nor good for hay, although heavy. Smart's was good on land not too forcing, else it runs to straw and blights off. Marshall's No. 3 is a good safe wheat, but he did not hold it in much estimation; had grown it for three years, and last year it did best. King's Solid Straw is too weak in the straw. Long Tom, selected by himself, grows too strongly for grain; sowed 3½ bush. on five and a half acres, and reaped fifteen bags off manured fallow; good milling wheat, white straw, stands up fairly well. Early Show is easily thrashed, and can be stripped whilst rain is falling. Gluyas did best on the unmanured land. The heat of October reduced the yield throughout. Silver King, Ranjit, Majestic, and Marshall's Hybrid might be placed as named in the order of merit, but neither could be compared with Carmichael's Eclipse. They were not manured, nor was the area or yield measured. Marshall's Hybrid was quite a failure owing to black rust.

Wilmington, March 4.

Present—Messrs. J. Hutchens (chair), W. Slee, M. Gray, J. Hannagan, J. Lauterbach, J. McLeod, J. Schuppan, and R. G. S. Payne (Hon. Sec.).

POISONED RABBITS AND CATTLE.—Mr. Schuppan reported on proceedings of the Annual Conference at Quorn. Mr. Gray called attention to statements made by Stock Inspector Winkler, that losses of cattle had occurred through eating the carcasses of rabbits killed by phosphorised pollard and also through chewing the bones. He questioned the accuracy of this, as he and Mr. Slee were large breeders of cattle, and for years had used phosphorised pollard for poisoning rabbits, having distributed as much as half a ton in a single year. Though this was scattered over land where both quiet and wild cattle were grazing, to their knowledge not a single beast had died or shown any ill effects. He admitted that if scattered in large lumps injury might result, but he much doubted that cattle would eat the carcass of a dead rabbit.

SEED WHEAT FUND.—The Secretary was instructed to inquire of the Secretary of the Central Fund as to disposal of seed wheat collected. There are about 150 bags available for distribution.

Kapunda, March 2.

Present—Messrs. W. Flavel (chair), G. Teagle, J. O'Dea, E. Weckert, J. H. Pascoe, Pat Kerin, Peter Kerin, H. T. Morris, and G. Harris (Hon. Sec.).

FEEDING HORSES.—Mr. Flavel stated that while in the North he found horses doing well on "cocky" chaff mixed with bran and pollard. He favored short feed for dinner and long hay morning and evening. Mr. Pascoe favored crushing all grains for horse feed. Mr. Teagle had tried "cocky" chaff, but did not favor its use for working horses. He believed in watering horses before meals. Mr. Morris was feeding "cocky" chaff and bran to his cows and they were milking well on it. He favored damping all feed for horses and cows. Mr. Kerin preferred Cape oats for hay, and Mr. Teagle White Tuscan wheat. For feeding horses the latter used two bags of bran to one of crushed wheat.

Quorn, March 7.

Present—Messrs. R. Thompson (chair), J. B. Rowe, F. Herde, C. Patten, W. Toll, and A. F. Noll (Hon. Sec.).

STUD BULL.—It was mentioned that the purebred dairy bulls now on loan to various Branches by the Department of Agriculture could be purchased at a low valuation, and that one-half the purchase-money would be remitted if the purchasing Branch would undertake to allow reasonable service (purebred dairy cows to have preference) for first three years at a nominal fee not exceeding 5s. Members decided to seek loan of a bull.

Paskeville, March 2.

Present—Messrs. A. Goodall (chair), H. Koch, J. H. Nankervis, A. C. Wehr, R. Hamilton, T. H. Price, J. P. Pontifex, J. C. Price, and W. S. O'Grady (Hon. Sec.).

DRILLING IN SEED.—The Chairman asked whether there was any advantage gained by putting in seed by means of the seed drill when no manure was used. He had had better results from seed broadcasted than from seed drilled in.

Other members' experiences were similar. Members were also of opinion that great care should be exercised not to put seed and manure too deeply. They considered it was impossible in this district to put it in too shallow so long as the seed was all covered.

WATERING HORSES.—Discussion on this subject took place. The Chairman watered his horses just before meals, and they did all right. His neighbor gave his horses water before and after meals and they also did well. Mr. Koch favored watering before meals, unless it was desired to spare the feed and spoil the horse. The Hon. Secretary agreed. Mr. Pontifex said water should be given very sparingly to horses just before being driven fast; if given two or three hours beforehand water would not hurt. It was unanimously agreed that provided the horses are not overheated the best time to water was just before feeding, as a thirsty horse cannot do justice to the food. Horses engaged in steady work on the farm, or idle horses, may have water at any time they may want it.

Mount Pleasant, March 8.

Present—Messrs. G. Phillis (chair), W. M. Vigar, W. Lyddon, F. Thomson, P. Miller, jun., and H. A. Giles (Acting Secretary).

ABNORMAL GROWTH.—The Chairman tabled spray of apples and vines in bloom with the fruit just forming; he attributed this out-of-season growth to the bush fires.

FERTILISERS.—Discussion on results from use of fertilisers took place. Mr. Vigar got good results from use of 75lbs. mineral super. per acre on dry land, but could see no result on cold sandy soil. Mr. Miller used bonedust and old pig manure well sifted, the former giving the better return. Mr. Giles only got 17cwt. of hay per acre from land fallowed, twice scarified, and drilled in with 1cwt. mineral super. per acre. It was estimated that this district averaged 9bush. to 10bush. per acre last season.

Amyton, March 8.

Present—Messrs. Wm. Gum (chair), T. Gum, H. Gray, Jas. Gray, Wm. Mills, Wm. Hawkes, A. Stone, J. Kelly, H. B. Turner (Hon. Sec.), and five visitors.

MOISTURE OF THE SOIL.—The Hon. Secretary read the following paper, compiled chiefly from L. H. Bailey's "Principles of Agriculture":—

Why Moisture is Important.—Moisture is necessary, for plants cannot grow without it, no matter how much plant food may be in the soil, and this moisture is needed to dissolve the plant food in the soil and so enable it to enter and to contribute to the building of plant tissue and to the maintenance of its life.

How Water is held in the Soil.—The water in the soil may be in one of three forms—free, capillary, and hygroscopic. The *free water* of the soil is that which flows under the influence of gravity, and in part is removed in drains, and it is also the source of springs and wells. It is not utilised by cultivated plants, but when properly taken care of becomes valuable, as it serves as a reservoir from which moisture may be drawn by capillary action. *Capillary water* is that which is held by adhesion to soil particles or in the cracks and openings between the particles. It is not controlled by gravity, but passes from one part of the soil to another just as opportunity offers, and its work is to keep the soil in uniform condition so far as its moisture is concerned, and it is this water that is the direct supply for plants; hence the greatest care must be exercised in providing for and saving it. The *hygroscopic water* is of little or no use to plant life, but it is interesting to know of its presence when apparently the soil is perfectly dry. It surrounds each particle of soil as a film, and perhaps constitutes 2 or 3 per cent. of the weight of the soil, and can only be driven off at boiling point temperature.

The Capacity of the Soil to Hold Water.—The capacity of the soil to hold water depends upon its original constitution—whether clay, loam, sand, &c.—and upon the treatment it

receives. If the humus or decaying organic matter has been used up its moisture-holding capacity is diminished. When it is stated that humus will hold more than twice as much as anything else it will be seen at once how important it is to keep up a good supply.

By long-continued cropping and tilling, unless humus is returned in some form, *e.g.*, green crops ploughed under, stable manure, &c., it may be so reduced that the soil consists very largely of mineral matter. One reason why new land frequently gives a better return is because it contains a large amount of humus, and consequently the soil is open and porous and the rain which falls is quickly absorbed, and is largely retained as capillary water. In applying humus care must be taken that sufficient moisture to decompose the matter is in the soil, as otherwise this layer when ploughed under would prevent any of the subsoil water from rising by capillary action. Tillage enables soils to hold moisture by two means—by increasing the depth of the soil in which plants can grow (that is by increasing the depth of the reservoir), and by increasing the capillary power of the soil.

Increasing the capillarity increases the moisture-holding capacity in two ways—it enables the soil to hold more moisture per square inch; it enables it to draw up moisture from the free water of the lower subsoil. Capillarity is increased by finely dividing or pulverising the soil. On the nature of the soil depends the manner of tillage. Those soils which are loose and porous should be compacted after ploughing, so that the capillary connection may be restored between the surface and the subsoil. A soil in which the particles are somewhat large, as in sandy or gravelly soils, may, if well compacted, show considerable rapidity of movement but weak power to retain moisture. In finely-divided clay soils the movement of capillary water is slow, but the retaining power is great. Occasionally it happens that the particles are so fine that the spaces disappear and there is produced a condition through which moisture and air cannot pass. It is evident, therefore, that soils which are too loose or exceedingly finely pulverised are not in the best condition for holding moisture.

The Conservation of Moisture—Conservation of moisture means the prevention of all unnecessary waste of the capillary water of the soil either by evaporation or weeds. Its object is to make the moisture pass through cultivated plants instead of from the surface into the air. Plants require their food in solution, and if the water is evaporated it leaves the plant food at the surface, hence the plant food is out of the reach of the roots and is useless.

If the soil is in proper physical condition moisture rapidly rises to the surface, by capillarity, to replace that which has been lost by evaporation or utilised by plants, and measures should be adopted to prevent this moisture from being lost by evaporation.

The most practical and effective way is by maintaining a surface mulch of soil. By frequent use of implements which loosen the soil to a depth of 2 in. or 3 in. this mulch may be preserved and the moisture saved. The drier and looser it is the more effective it is. This dry and loose surface breaks the capillary connection between the air and the moist under-soil. This soil mulch should be renewed during the growing season as often as it becomes hard or baked, by shallow tillage.

Hartley, February 27.

Present—Messrs. J. Stanton (chair), J. Jaensch, J. Sanders, A. Thiele, T. Jaensch, and B. Wundersitz (Hon. Sec.).

BEST WHEATS.—Samples of Dart's Imperial, Petatz Surprise, Early Para, and Purple Straw wheats were tabled. Dart's Imperial and Purple Straw were considered the best wheats for this district, the former being a good standing wheat. Petatz Surprise makes too much straw if sown early.

Richman's Creek, March 4.

Present—Messrs. W. Freebairn (chair), A. Knauerhase, M. Hender, F. Mattner, J. A. Knox, A. Nicholson, J. J. Searle, W. J. Wright, P. J. O'Donohue, J. M. Kelly, and J. McColl (Hon. Sec.).

BEST WHEATS.—Question of best variety of wheat to grow on the plains caused some discussion. The Chairman thought Bearded or Twentyweeks as good as any. Mr. Knox found Red Straw the best all round, taking one season with another. Mr. Mattner had good returns from Steinwedel, Early Para, and Allora; King's Early had not done well. Mr. Knauerhase considered much depended on the season; Twentyweeks was best when locusts were about.

HAY FOR DAIRY COWS.—The Chairman had noticed a statement that ensilage was not necessary for dairy cows when plenty of good hay was available. Mr. Hender found hay made from native grasses was good for milk production. Mr. O'Donohue did not consider hay as productive as bran and chaff, but it was better than dry grass. The Hon. Secretary did not consider hay alone good for milk production. A few years ago when other food was scarce their cows were fed principally on hay, and although it kept them in good condition the flow of milk did not increase in proportion. He thought good "cocky" chaff with a little bran would give better results.

OLD SKED AND BUNT.—A member asked whether, if seed wheat was kept for four years, the crop from it would be less liable to bunt.

Mount Remarkable, February 26.

Present—Messrs. C. E. Jorgensen (chair), W. Lange, T. P. Yates, J. B. Murrell, W. Morgan, H. N. Grant, and J. O'Connell.

FERTILISERS.—Mr. Lange said he was convinced that in a fair season the use of commercial fertilisers would be very profitable in this district. Last year he got a bag to the acre ~~more~~ off stubble land manured with super. than from unmanured fallow. Considerable discussion on the use of fertilisers ensued.

THE WORK OF THE MEMBERS.—Members ~~were~~ unanimous in taking exception to the statement of Mr. R. Homburg, M.P., that no practical result from the thirteen years' work of the Bureau could be shown. In the opinion of the members the statement referred to was not correct.

Kanmantoo, February 26.

Present—Messrs. J. Downing (chair), W. G. Mills, J. Hair, A. D. Hair, P. Lewis, F. Lehmann (Hon. Sec.), and one visitor.

HORSE FEED.—Messrs. Hair use Cape barley soaked in bags immersed in water for twenty-four to thirty-six hours, then transferred to other bags, covered with empty bags or chaff until the grain sprouts. In this state the barley loses the heating property possessed by raw grain. Other members favored crushed oats.

EXPERIMENTS.—The Chairman said he had been very unsuccessful with the vegetable seeds received from the Central Bureau. Messrs. Hair and Mills said Marshall's Hybrid wheat was a failure; Majestic was a splendid wheat, ripened at same time with Purple Straw. Members agreed that any experimental grains should be grown amongst the main crops, because the birds would destroy the plots if grown in gardens or separated plots.

Koolunga, February 28.

Present—Messrs. J. Sandow (chair), J. Button, J. Jones, J. Pengilly, J. Butterfield, G. Cooper, R. Lawry, J. C. Noack (Hon. Sec.), and one visitor.

PICKLING WHEAT.—Mr. Cooper used about a teaspoonful of arsenic in water for each 4bush. of seed, and had very little bunt the year before last, but last season he had a little trouble from bunt, which he thought was due to the drill. Mr. Jones was convinced that if the wheat were clean no pickling is necessary; but the spores of bunt could be killed with arsenic or bluestone or

even clear water. [Possibly so, if the seed is kept damp for a day or two and then dried before sowing.--GEN. SEC.] Messrs. Button and Pengilly favored the use of bluestone.

NOXIOUS WEEDS.—Several members condemned the neglect by certain large landowners to comply with the provisions of the Noxious Weeds Act, thereby nullifying the efforts of adjacent landowners to exterminate the noxious weeds.

MEMBERSHIP.—It was resolved to strictly enforce the rule with respect to members who fail to attend meetings of the Branch.

Mount Gambier, March 9.

Present—Messrs. D. Norman, sen (chair), D. Norman, jun., W. Mitchell, T. H. Williams, G. Bodey, W. Barrows, T. Edwards, M. C. Wilson, and E. Lewis (Hon. Sec.).

CONFERENCE.—Members were requested to prepare exhibits and papers for the conference of South-Eastern Branches to be held at Penola on April 24th.

DISTRICT VETERINARY SURGEON.—After a long discussion as to whether it would be possible to raise a sufficient sum annually as a guarantee fund to secure the services of a qualified veterinary surgeon for the South-Eastern District—of which grave doubts were expressed by several members—the matter was left in abeyance.

TUBERCULIN.—Referring to some extracts from a paper read at the previous meeting, Mr. T. H. Williams said the statement that “tuberculin would sometimes cause tuberculosis in an animal and could never be eliminated,” was an extraordinary one, and required authoritative confirmation. In regard to pleuropneumonia they could not be too careful in taking the virus for inoculation of other animals, because the first animal might be affected with tubercle. The extraction of such virus should only be done by someone who had made the matter a study, as, if impure, it might cause blood-poisoning. He maintained that the tuberculin test was, in the majority of cases, reliable. A beast might be slightly affected with tuberculosis, and react with tuberculin, and yet it might be difficult to find the diseased spots on a *post-mortem* examination. It was not contended that the test was infallible, but it was by far the best thing as yet. Chairman said he had learned that not 1 per cent. of cattle sent to market were tuberculous.

Hahndorf, March 9.

Present—Messrs. A. von Doussa (chair), F. H. Sonnemann, C. Bom, C. Jaensch, P. Schubert, A. L. Paech, D. J. Byard (Hon. Sec.), and several visitors.

POULTRY.—Mr. S. Cope, of Mount Barker, the well-known judge and breeder of poultry, gave a very interesting address on poultry-keeping. For layers he recommended Andalusians and brown and white Leghorns, for table birds, Indian Game crossed with pure bred Dorking, Langshan, Orpington, Wyandotte, or Plymouth Rocks. As an all-round bird the Wyandotte was recommended for the hills. Plymouth Rocks and White Leghorns intended for exhibition should be kept out of the sun, or the color will deteriorate. Overstocking was strongly condemned. Houses should be whitewashed weekly and sulphur freely used on the fowls. Old tobacco leaves in the nests will keep away vermin. The importance of a dust bath and a plentiful supply of grit was insisted on. Variety of food was essential to success. Mr. Cope condemned

artificial mothers; his plan was to fill a kerosine tin with hot water, wrap it in flannel and place in a wooden box with a clear space of 6in. all round the tin. Chicks thus got both warmth and fresh air. He could speak with experience of the value of the water glass for preserving eggs. Eggs must be put down quite fresh, and be pricked before boiling to prevent the shells cracking.

Kadina, March 6.

Present—Messrs. T. M. Rendell (chair), J. M. Inglis, H. Johnson, H. Kennett, S. Roberts, M. Quinn, and J. W. Taylor (Hon. Sec.).

FARMERS' UNION.—Arthurton Branch wrote that it was desirable that the S.A. Farmers' Union should be vigorously supported and its operations extended. The Branch had disposed of 200 shares locally, and wished all other Branches to aid in the undertaking. Several members spoke in support of the object sought by Arthurton Branch, and it was urged that the Farmers' Union maintained higher prices for produce than would prevail were it not in existence.

Colton, March 8.

Present—Messrs. P. P. Kenny (chair), M. S. W. Kenny, E. Whitehead, A. C. Riggs, A. J. Inkster, B. A. McCaffrey, W. J. Packer, W. A. Barnes, and R. Hull (Hon. Sec.).

WOOL-CLASSING.—The Chairman reported that he had seen Mr. Geo. Jeffrey, and that gentleman had promised to visit this district during next shearing if possible for the purpose of giving lectures and demonstrations in wool-classing.

HORSE COMPLAINT.—Mr. Whitehead said one of his horses was suffering from a warty kind of growth about the nose and mouth. He wished to know what to do for it. [Impossible to say without some better description of the complaint.—GEN. SEC.]

Renmark, February 28.

Present—Messrs. E. Taylor (chair), W. Waters, F. Wyllie, F. Cole, R. Kelly, J. A. Forde (Hon. Sec.), and several visitors.

FERTILISERS FOR FRUIT TREES.—Mr. Forde read a short paper on this subject, mainly extracts from previously-published articles, with reference to requirements of Renmark. Mr. Turner had tried Thomas phosphate with other manures, but it was too early to say what the result would be. The Hon. Secretary said a series of systematic tests with this fertiliser, by itself and mixed with others, was necessary. The Chairman read a paragraph from a weekly paper warning growers of danger of loss if superphosphate and sulphate of ammonia were mixed together. Mr. Clark said green manure crops did not seem to suit this climate. Mr. Wyllie thought if they were ploughed under during winter they would rot sufficiently.

Wandearah, February 4.

Present—Messrs. Geo. Robertson (chair), W. Halliday, W. Roberts, E. Jacobs, W. Munday, E. H. Eagle, C. E. Birks (Hon. Sec.), and one visitor.

DAIRY BULLS.—Considerable discussion took place on the system of loaning bulls to the Branches. Members were agreed that the system did not work so

well in this district as in more closely-populated localities. Discussion also took place on the question of purchasing a bull with the assistance of the department.

WATERING HORSES.—Members were agreed that it was best to water horses before feeding unless they were very hot and the weather cold. They failed, however, to see any advantage in watering them half an hour before feeding, as suggested by the General Secretary; besides which, they considered it almost impracticable on the farm. The members were desirous of knowing the reason for the suggestion to water half an hour before feeding. [Many horse owners hold the opinion that, if a horse is thirsty, a little water given half an hour before feeding will do more good than keeping him thirsty for an hour or two after feeding.—GEN. SEC.].

EARLY BREEDING.—One member, speaking of the precociousness of Jersey cattle, stated he had a heifer calve at sixteen months old. He considered that the only way out of the difficulty was to keep the bulls shut up.

Wandearah, March 4.

Present—Messrs. Geo. Robertson (chair), J. Wall, F. Joyce, E. H. Eagle, W. Munday, W. J. Fuller, W. Roberts, and C. E. Birks (Hon. Sec.).

PREPARATION OF SOIL FOR SEEDING.—Congress paper by Mr. R. Marshall on this subject was discussed. The majority of those present agreed with most of the methods and practices touched on by Mr. Marshall, but could not agree with the practice of discarding the drill for putting in the seed in this district, as it was the only implement by which the seed can be properly sown in very light land. Scarifying or ploughing always left a considerable quantity of seed on the surface, and harrowing was quite out of the question here. One of Mr. Marshall's objections to drilling in the seed, *i.e.*, the delay caused through wet weather, has only in very exceptional cases to be considered by farmers in this locality, as the drill can be worked when any other seeding implement could be. The practice of applying the manure before the seed in clean land was considered to have distinct advantages, but where oats were prevalent putting in seed and manure together gave the wheat a better chance to smother the oats.

Mallala, March 12.

Present—Messrs. G. Marshman (chair), S. Temby, A. F. Wilson, M. H. East, J. Jenkins, A. Moody, W. Temby, R. Butler, T. Nevin, S. Churches, and W. R. Stephenson (Hon. Sec.).

STOCK DISEASE.—Mr. Wilson has lost a cow, which, upon *post mortem*, showed much-enlarged gall with fully a quart of fluid in it.

SEED WHEAT FUND.—A subscription was opened to provide seed wheat for farmers in the North-East whose crops have failed through locusts and drought.

SEED WHEAT.—Mr. Worden forwarded a paper, of which the following is the substance :—

However industrious and painstaking the farmer may be in preparing his land for the seed, much depends upon the quality and variety of the seed he selects. Every farmer experienced in wheat cultivation knows how essential it is to have clean seed in order to secure a clean crop. If we sow charlock, poppy, wild oats, or any other enemy with the seed, we may be sure that we shall reap an abundant harvest of those weeds at the expense of the wheat crop. If our seed is clean, and land likewise, we expect a clean crop; should it turn out otherwise we can say, like the man in the parable, "An enemy hath done this." I once heard of two farmers conversing; one with the other: said one, "I sowed clean seed in such-and-such a field

and it came up all drake." "Yes," replied the other, "it does happen like that sometimes." I am sure none of us are likely to credit a story of that kind. In addition to clean seed, it is imperative that we should secure a good plump grain, if obtainable. Very good results *have* been obtained from small shrivelled grain, but perhaps under unusually favorable conditions, when there has been abundance of moisture in the land for the plant in its early stages. It seems reasonable to conclude that a good plump grain must be better than a shrivelled one. The plump grain contains more food for the tender plant until the roots are sufficiently developed to draw plant food from the soil. During a dry time, after having put in the crop, when the tender blade is just peeping through the soil, we think the advantage of a plump grain will be seen. The wheat plant, like other plants (and animals as well), if checked in the early stages, frequently has a struggle to recover the ill effects, and does not in some cases recover at all, and of course the result is an inferior crop. A good plump grain would to some extent at least minimise the risk. Another important matter is the selection of the variety. Every farmer knows that some varieties will yield better under varying conditions than others. The year just passed, I drilled King's Early and Allora, side by side, on land treated in the same way and drilled at the same time. The King's Early yielded 22bush., and the other (Allora) four bags, thus showing that a deal depends upon the variety. Most farmers have their pet wheats; mine is Dart's Imperial or Dart's Bluey. I would not like to say it is the best wheat one can grow, because someone may take exception to it, but it certainly is one of the best. It undoubtedly is a good milling wheat, and if desired for hay, is equally suitable, giving more corn and color in the hay than any wheat I know of. I do not know of any wheat that will stand a storm like it. I have been told it is very susceptible to red rust, but we have had very little rust since I have known it. Purple Straw, Red Straw, the different Tuscan (white and purple), and all the old tried friends I prefer to abide by before running to any extent after the endless new varieties; not that we want to discourage in any way the introduction of new varieties, but let the old wheats comprise the bulk of the crop until the new has been proved under varying conditions. The wheats already mentioned may be classed as late wheats; but it is advisable always to have some early varieties, so that the crop will not all come in at the same time. Among the early wheats may be mentioned King's Early, Early Para, Newman's, Steinwedel, and others. For the present at least I intend to favor King's Early and Newman's. My neighbors who have grown Newman's speak well of it. It is not a beardy wheat, which is an advantage. The time of sowing should be as early in April as state of land and weather will permit for slow-growing wheats. They will then get a good start and well rooted before the cold weather. The middle of May is a good time for early wheat. I would rather sow them in June than much earlier than middle of May.

Penola, March 9.

Present—Messrs. E. A. Storey (chair), L. W. Peake, D. McKay, W. Miller, T. H. Morris, E. McBain, S. B. Worthington, J. W. Sandiford, Dr. F. Ockley, and R. Fowler (Hon. Sec.).

CONFERENCE.—Further arrangements were made concerning the Conference of South-Eastern Branches to be holden at Penola on April 24th, and a strong committee of ladies undertook to attend to the catering.

CODLIN MOTH.—It was decided to request the Horticultural Instructor to visit the Coonawarra Fruit Colony and to give a lecture on the codlin moth. It was decided to request the members of Parliament for Victoria and Albert to endeavor to arrange with the Railways Commissioner to convey cases in the flat at similar rates with "return empty" fruit boxes, so as to prevent introduction of codlin moth larvæ in empty cases.

Brinkworth, March 7.

Present—Messrs. S. Aunger (chair), A. L. McEwin, J. Graham, H. J. Shepherd, J. Cross, W. Welke, and J. Stott (Hon. Sec.).

PICKLING WHEAT.—Mr. Aunger uses a cement tank for holding the pickle, and immerses the bags, containing a bushel of seed. Mr. McEwin thinks the drills break the smut balls. He agreed with immersion of the seed in a bag, and always dissolved his bluestone in a bag hung in the water near the surface.

He had more bunt since using the drill. Mr. Aunger had no bunt for eight or nine years, but when he sowed with the drill and without pickling he had seen bunt; so now he would always pickle. Mr. Cross soaked a bag full of seed at once in a trough of pickle. Pioneer, Purple Straw, and Steinwedel were very subject to bunt. Mr. Graham used half an ounce of arsenic to pickle a bag of seed, placed in a bran bag, and never had bunt. Mr. H. J. Shepherd used arsenic in same way, but lately had taken to bluestone. No one should sow bunted wheat. Mr. Welke used 8ozs. to the bag.

Mount Compass, March 9.

Present—Messrs. M. Jacobs (chair), R. Peters, R. Cameron, A. Sweetman, F. Slater, F. McKinlay, S. H. Herring, C. S. Hancock, A. J. Hancock (Hon. Sec.), and one visitor.

SEASONABLE HINTS.—Sow cabbages, cauliflowers, turnips, swedes, salad plants, &c.; plant out cabbages and cauliflowers; sow oats, barley, and clover for green feed. Mr. Cameron reported that his potatoes were attacked by a kind of rust or scab.

EXHIBIT.—Sweetwater grapes from vine planted three years ago, by Mr. E. C. Good, in the locality.

Eudunda, March 4.

Present—Messrs. F. W. Paech, M.P. (chair), H. Martin, C. Wainwright, H. D. Neil, and W. H. Marshall (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. Martin tabled samples of Majestic and Silver King wheats from Bureau seed. Seed was hand sown, with Thomas phosphate, on May 14th, and was reaped on December 13th. From 8ozs. of Majestic he reaped 10lbs., equal to 20bush. per acre, and from 14ozs. Silver King he got 22lbs., equal to 25bush. per acre.

LOSS OF STOCK.—The Chairman reported that a farmer at Point Pass had lost some forty young fat sheep. They were attacked very suddenly, losing the use of their limbs, being unable to walk and falling down; the head is drawn upwards, and they soon die. The Hon. Secretary suggested that the sheep had been feeding on stubble land, or possibly had eaten of some of the poisonous plants growing in this locality. [Or poison laid for rabbits.—GEN. SEC.]

Gawler River, March 1.

Present—Messrs. A. M. Dawkins (chair), J. Badman, J. Hillier, W. Clark, F. Roediger, J. Barrett, T. P. Parker, H. Heaslip, C. Leak, A. Bray, H. Roediger (Hon. Sec.), and one visitor.

OFFICERS.—Messrs. J. Badman, A. M. Dawkins, and A. Bray were elected Chairman, Vice-chairman, and Hon. Secretary, respectively, for the ensuing year. Mr. F. Roediger agreed to act as Assistant Secretary.

WEEDS.—Mr. Parker tabled weed, identified by the General Secretary as a species of *Blennodia*. It was not injurious to stock, but, if plentiful, would impart a very strong odor to milk. Mr. F. Roediger said the plant was spreading fast; it was very prolific, and had been known to come to seed within six weeks of its appearance above ground. Some discussion on weeds took place. It was agreed that the worst weeds in this district were charlock, wild cabbage, and soursops. Mr. Parker recommended that stubble land infested

by weeds should be burnt over as the best means of destroying the weeds. To get rid of the wild mustard the best plan was to cut infested crops for hay before the weeds flower. Mr. Parker said where mineral super. was applied to the land it appeared to destroy soursops, but members thought this was due to the super. forcing the wheat ahead, and, consequently, choking the soursops. Several members stated that, with good cultivation and the application of commercial fertilisers, good crops of wheat could be grown on land badly infested by soursops. The great difficulty in clearing the land of many kinds of weeds was due to the seeds remaining dormant in the soil for years, only germinating when favorable conditions arise. Members generally agreed that thorough cultivation was the best method of keeping in check and eradicating most weeds. Mr. Badman had destroyed artichokes by cutting through the main root and applying a little salt. Other members considered the artichoke and various thistles good fodder for sheep and cattle, and thought it a mistake to destroy them. Couch grass could be eradicated by deep winter cultivation and constant stirring during the summer.

Bute, February 26.

Present—Messrs. H. Schroeter (chair), A. Schroeter, W. H. Sharnan, R. Commons, W. A. Hamdorf, and A. Sharnan (Hon. Sec.).

STATISTICAL—About 35,000 acres were under crop in this district last year. The average yield was about 7bush. per acre. Two thousand acres were cut for hay, and 5,000 acres were under oats and other crops. The average yield of hay was three-quarters of a ton per acre. The whole district suffered from frost and then from drought. Purple Straw and Dart's Imperial wheats were the most favored wheats in this locality.

Inkerman, March 5.

Present—Messrs. D. Fraser (chair), Jas. Sampson, W. Fraser, J. Lomman, G. Peter, C. H. Daniel, C. E. Daniel, and W. A. Hewett (Hon. Sec.).

BUSINESS MEETINGS.—It was decided to draw lots to decide who should be responsible for initiating discussions on practical subjects at each succeeding meeting.

FERTILISERS.—Discussion took place on quantity of manure per acre to use in this district. Mr. Daniel advocated 80lbs. per acre mineral super. on scrub land, and 50lbs. to 60lbs. on clay land. Mr. Sampson had used 80lbs. per acre on heavy land. Members agreed that little advantage would be gained by manuring heavily owing to the light and uncertain rainfall of this district, and that 60lbs. to 70lbs. of mineral super. per acre was sufficient. Members favored drilling seed in with fertilisers, as it came away quicker than if put in without manure.

Cherry Gardens, March 12.

Present—Messrs. R. Gibbins (chair), J. Potter, T. Jacobs, C. Lewis, J. Lewis, J. Richards, G. Hicks, E. Wright, H. F. Broadbent, G. Brumby, W. Burpee, A. Broadbent, and C. Ricks (Hon. Sec.).

POISONING RABBITS.—The question was raised as to whether it was legal to lay poison for rabbits without giving proper notice to the public. The reason for the inquiry was the fear that cattle, pigs, and other domestic animals might

be poisoned by eating the baits or the dead rabbits, and the owner of the property made responsible for the loss. It was decided to ask the General Secretary for information on the subject. It was decided to suggest to the Clarendon district council that a substantial prize be offered to the person destroying the most rabbits in the district during the year. [One Act makes it a penal offence to lay poison on land, unless elaborate notices have been given by advertisements, and by affixing prominent notices on the land. Another Act makes it compulsory on the occupier of land to take *effectual* measures for the destruction of rabbits, and the most effectual method of destruction is by laying poison. Who can decide where the laws disagree?—GEN. SEC.]

SPARROWS.—Inquiries having been made by several Branches as to the best means of dealing with the sparrows, the following method has been found successful in this district. For a number of years past the Branch has offered a prize each month for the largest number of sparrows' heads and eggs brought in, and at the annual show larger prizes are offered for the largest number collected during the year. This has been the means of keeping the pest within reasonable bounds.

Meningie, March 16.

Present—Messrs. M. Linn (chair), C. J. Shipway, S. F. Robinson, T. W. R. Hiscock, W. J. Botten, and H. B. Hacket (Hon. Sec.).

IMPACTION IN CATTLE.—Members concluded that there is no effective treatment for advanced cases of impaction of the omasum, as then no kind of food or medicine can remove the dried-up impacted matter. [Impaction can be prevented or stopped in early stages by providing silage or green fodder, or feeding some bran, roots, oilcake, with steamed hay, &c. Give also a handful of bonedust, a little salt, and very little sulphate of iron in food two or three times a week.—GEN. SEC.] A resident has a young cow which walks as though tender-footed or "chest-foundered." These symptoms prevailed even when there was plenty of green grass. [This is probably caused by impaction. Green grass will not remove impacted matter, nor will the grass be completely digested; in fact, the trouble is often aggravated when the young grass is abundant.—GEN. SEC.]

STAGGERING HORSE.—Mr Hiscock has a 3-year-old colt, apparently healthy in all respects, except that he suddenly became partially paralysed in the legs, staggers, and sometimes falls on his knees. This has lasted several months.

Stansbury, March 2.

Present—Messrs. A. Anderson (chair), P. Anderson, C. Faulkner, F. Faulkner, J. Sherrieff, G. Jones, G. Brundell, H. C. Pitt, and P. Cornish (Hon. Sec.).

OFFICERS.—The Chairman and Hon. Sec. were thanked and re-elected.

CATTLE DISEASE.—Several residents have lost many head of cattle this year, and this has been a serious drawback to the dairy industry. Many supposed remedies have been tried without effect. [I am convinced that the trouble arises from too much dry fibrous food during autumn and early winter, and to deficiency in quality of food generally. Ensiled green fodder and cultivated green crops would do much to remedy the evil. Fertilise the pastures with super. or bonedust, and feed the cows frequently with bran, crushed oats, barley, &c., with addition of a handful of fine bonemeal, salt, and iron sulphate.—GEN. SEC.]

THATCHING STACKS.—Some members said that in thatching with straw the heads should be at the lowest part, else the water would lodge in the flag. Others thought it matters not which way the straw is laid. It was desired that other Branches would give this matter some consideration.

ANNUAL REPORT.—Eleven meetings have been holden, with an average attendance of over seven members. One paper only has been read during the year, and one lecture given, on "Wool and Wool-cleaning," by Mr. G. Jeffrey. Discussions have taken place on manures, mixing various fertilisers, bags as wheat, change of seed, bunt, takeall, grubs in wheatfields, yellow-looking wheat crops, roup, worms in horses, lambs for export, pens or paddocks for pigs, licences for stallions, iron phosphate for sheep, anti-grease, lime and salt as a fertiliser.

EXPERIMENTS.—Mr. C. Faulkner reported as follows upon wheats received from Central Bureau for trial :—

Majestic.—A good early beardless wheat; stands very well, and stools fairly. It was rather light bearded, the grain pinched a little, but this was due chiefly to the plot being sown too thickly. It is a very promising early variety.

Silver King.—A fair-looking wheat, though rather late. It headed very well, has a good strong straw, and stood well. It will probably make a good wheat for clean land that will not blight; but on land that is liable to blight, or dirty land, it does not develop quickly enough.

Ranjit was not very promising, giving a plant very spindly and weak in the straw, going down badly. The head was light and small. The grain after being threshed is very good, being large and long, but the results given with it make it hardly worth testing further.

Marshall's Hybrid.—This wheat showed a very promising crop, the plot looking fit for fully 20 bush. It was well headed, strong-strawed, and stools well. It is also nice and early, being on a par with Majestic in that respect. The grain, however, was rather small, but this plot, like Majestic, was also sown too thickly. This wheat and Majestic are both well worthy of further trial.

FRUIT KERNELS FOR PIGS.—Mr. P. Anderson said that fruit kernels are excellent food for pigs, which thrive and look well when fed upon them.

Morgan, March 12.

Present—Messrs. R. Windebank (chair), C. F. W. Pfitzner, G. Ruediger, R. Wohling, E. French (Hon. Sec.), and one visitor.

BULL.—This Branch proposes to purchase a pure-bred shorthorn bull, of a milking family, if such can be procured at a reasonable price.

LOCAL PHOSPHATES.—Members are impressed with the idea that deposits of phosphatic rocks can be found near Morgan.

Millicent, March 7.

Present—Messrs H. F. Holzgreffe (chair), H. Hart, S. J. Stuckey, H. A. Stewart, W. R. Foster, W. J. Whennen, A. McRostie, R. Campbell, and E. J. Harris (Hon. Sec.).

CONFERENCE.—Referring to the conference of South-Eastern Branches, to take place at Penola on April 24th, Mr. R. Campbell recommended that, as the South-East is a very large district, it should be divided for conference purposes into two sections. Mr. Stuckey proposed that this question shall be discussed at the evening conference—to make Penola, Mount Gambier, and Millicent one section, and Lucindale, Naracoorte, and Bordertown the other. This was carried.

EXHIBITS.—Mr. H. F. Holzgreffe tabled large Williams' Bon Chretien pears (wrongly named "Duchess" and "Bartlett" here), and Crow's Egg apples.

Mr. W. J. Whennen tabled brown ears of wheat found amongst Ranjit crop. [Ranjit, being a crossbred wheat, will throw back to one of its original parents, or "sport" several varieties.—GEN. SEC.]

COAST DISEASE.—Mr. W. R. Foster read the following paper :—

Considering the difficulty of rearing stock in some parts of the South-East on account of coast disease, it seems strange that so little is done either to find the cause or to apply remedies. It does not appear to be a question worth worrying about by those who hold sufficient healthy country for change, but for those who hold "coasty" land only the question is likely to be a very serious one if potato and chicory cultivation becomes unremunerative, which we may expect with the removal of the protection which has so greatly assisted those industries. We are told by some that there is no coast disease in the South-East, and that what we call coast disease is the result of a deficiency in the soil of certain elements, principally lime and iron. Probably the idea regarding want of iron, etc., is correct, but I also believe that on some of our sour flats, especially those which produce a lot of rough herbage, there is something in the soil which is assimilated by the grass or herbage and produces gross humors in the blood of the animals that feed upon it. I think it is known to most people who have had much experience of this kind of country, that animals in low condition changed from sound country put on flesh rapidly for a time, but if left too long deteriorate and become unhealthy. A stockowner who has had many years' experience of the most coastly portion of the district, collected a quantity of a certain substance which he thought caused the trouble, and forwarded it to Melbourne for analysis, asking what effect would this have upon animals taking it with their food. He received a reply that for a time its effect would be to cause them to fatten quickly, but if continued its effect would be injurious. If horses fed on this coastly herbage have constant exercise they will continue healthy and will work as well as if fed on healthy country; but stop the work, and, if it is the coastly season, they will soon be in a very bad state, bare from hoof to body, and smell fearfully. This may not occur in every case, but it is a common occurrence. Upon some of our rich back flats it often happens for cattle in good condition to die quite suddenly without any apparent cause. Those cases appear most common where the grass known as Black Prairie is plentiful. Now, all this seems to prove that the trouble is caused by something which acts as a poison, rather than, as some people believe, by a deficiency of lime, iron, &c. In the case of animals which become poor and weak if left too long on hilly or range country, I think it probable that disease in their case is caused by a deficiency of iron, lime, &c. Some may think this a ridiculous idea considering the land is known as limestone country. It, however, appears to me the stone is mostly sand; and again, the lime may not be in a condition in which it can be assimilated by the herbage. I think it reasonable to assume that good cultivation, and the use of suitable manures, would make a large portion of our coastly lands comparatively healthy. The question is, which are the most suitable manures and what are the quantities to use. It would be a good idea to invite those who have made experiments to give the public the results.

Mr. Hart said land held by himself and R. J. Holland was once so coastly that it was not possible to raise cattle on it, but after a liberal treatment with bonedust and sulphate of iron cattle could now be fattened. He remembered reading some years ago of a farmer on Thistle Island who had dressed a paddock with sulphate of iron and used it for a hospital paddock. Some years ago he (Mr. Hart) had dressed a strip of land with Cave's guano, and though the grass rooted well the stock would not let it make an inch of growth, whereas on untreated land the grass in the same paddock was up to the sheep's bellies. Mr. Stuckey said the disease was found in localities with healthy land adjoining. He had not the slightest doubt that years ago many deaths from impaction were put down to coast disease. A farmer on the Flats had told him that since giving his cattle bonedust he had lost none. Mr. Holzgreffe said the Millicent Flats were by many considered coastly. However, he knew where horses were kept for seven weeks they got "coasty," but a change soon brought them round. He had spoken to Inspector Williams about giving bonedust to stock, and the inspector asked, "How about these bones coming from cattle which had died of disease?" He (Mr. Holzgreffe) thought it would be the better plan to treat a small paddock and keep it for a hospital. He was a great believer in salt for stock. Mr. Campbell said there was a danger of carrying disease through bonedust, and mentioned that anthrax was introduced into New Zealand from New South Wales by this means. This objection could, however, be overcome by boiling the bonedust. Mr. Stewart said that Mr. Foster,

of Lake George, found his stock getting benefited by putting old scrap iron in the water trough. Mr. Stuckey said that it was a good idea to mix bonedust, sulphate of iron, and salt in a box or trough. [About $\frac{1}{2}$ lb. sulph. iron, 20 lbs. salt, 15 lbs. pure bonemeal.—GEN. SEC.]. Mr. Foster instanced a case of a horse in work being kept in a healthy condition on coastly country, but only a few weeks after being spelled in same paddock it nearly died. He thought in this case the exercise had kept this disease in check. All members agreed that salt, sulphate of iron, and bonedust was a good thing for the disease.

TREATMENT OF NON-BEARING FRUIT TREES.—Mr. R. Campbell read a paper to the following effect :—

This question as to treatment of non-bearing fruits is often asked, but cannot be answered correctly without knowing something of local relative conditions. Many trees do not bear because they have been planted too deeply, this being done, in the planter's opinion, to give them "a good hold" and prevent their being blown over. If the trees are in good soil they may live for years and be unfruitful; if in poor soil they will probably not live many years. There are a number of instances in this district where the trees are suffering from this cause. The only remedy is to lift the tree, taking two seasons to complete the operation. Dig a hole on one side of the tree (say 3 ft. back), cut the roots and pack the soil under, bringing the outer ends downwards. Complete the operation on the other the following season, and raise the trunk of the tree (with a lever if necessary) and pack the soil firmly underneath. The natural depth for a well-grown tree is such that the shoulders of the roots should show at the base of the tree, which condition is seen in most naturally-growing forest trees. If the trees are growing vigorously try summer pruning. For stone fruits this will consist of cutting back about half the season's growth when the ends of the shoots have hardened, and thin out shoots if too numerous. Apples and pears can be served the same, but lateral shoots should be simply broken, allowing the shoot to hang by a piece of wood and bark, leaving about three buds on the lower part. In autumn merely cut away the shoot where broken, leaving the ragged end till next season, then clean off. If a wood shoot develops next season, repeat the breaking process. If the tree is over vigorous root pruning may have the desired effect, doing half of the tree one season and complete the following. This should be done in the spring. Some growers recommend girdling the tree by taking out a narrow strip of bark, say three parts round the tree. It is better to start this on separate limbs and after growth has started. For pear trees some growers recommend taking up the tree and re-planting. This is simply severe root-pruning. Others advise putting up to 20 lbs. of salt round the tree, according to size. [This, in many localities, would end in the death of the tree.—GEN. SEC.]. Trees may not bear through a lack of phosphate or potash in the soil. This will most likely be the case if trees set their fruit and then cast them. Peach trees sometimes fail to fruit through the lack of knowledge of its fruiting habit, the fruit buds going with the pruning. Peach trees should not be pruned till late in winter or late in spring, as many buds are cast in winter. The fruit buds of peaches are only to be found on wood made during the past season. American cherry growers advise pruning the trees as soon as the fruit is off, as wounds are said to heal much better at that time. No trees should be pruned to fruit buds on wood more than one year old (and not on that if it can be avoided) else the limbs will be affected with "dieback." In some cases disease may affect the fruiting capacity. If fungoid disease, spraying Bordeaux mixture will help. If insect pest, kerosene emulsion, resin wash, tobacco and Paris green will be effective. Trees cannot bear unless they have been able to make previous provision for so doing, e.g., apple and pear trees take two seasons to make fruit-bearing spurs, but unless the conditions are all otherwise favorable fruit cannot result, and the spur may keep on extending without even flowering, and, if the tree is vigorous, may even break out and form a new branch. When trees are vigorous and fruit spurs have not formed they may generally be developed on apples and pears by cutting a notch under a dormant bud into the wood; this will prevent the elaborated plant food descending to the roots, and so store up material in a fruit spur. If the cut is made in the shape of a over the bud, it will, in all probability, develop into a wood shoot in strength according to the vigor of the tree. This practice may be used to even-up lop-sided trees. An American suggestion is to bare the roots without injuring them 2 ft. or 3 ft. back from the tree, and leave open all the summer. This will probably suit those who do not care to root prune, but will not likely be so effective. This last may be taken as an evidence that roots should not be planted too deeply.

Mr. Hart said he had several Winter Nelis pear trees which flowered profusely but set no fruit. Last season he pruned about two-thirds of the buds of one tree, and it had borne three times as much fruit as trees not pruned in this manner. Mr. Holzgreffe said he had sprayed apricot trees with Bordeaux mixture. He had used plenty of lime and sprayed twice, but he had kept the stuff mixed from the first application. The lime and bluestone may be dissolved separately and kept, but must only be brought together just before using.

Forster, March 14.

Present—Mr. J. Johns (chair), F. Johns, W. Johns, J. Childs, J. Retallack, J. Sears, A. Schenscher, E. Schenscher (Hon. Sec.), and two visitors.

WORMS IN FOWLS.—Mr. J. Childs said several fowls killed by himself contained a number of worms in the intestines. [Try tansy leaves (*Tanacetum vulgare*), boiled in water. Tansy is a common cottage garden plant, and is a good vermifuge, lately recommended as the only known cure for bots in horses. —GEN. SEC.]

COWS CHEWING BONES.—Mr. F. Johns has tried placing rock salt about for his cows, but has not noted any cessation of their habit of chewing bones. [Give them bonedust with steamed chaff, or bran, or crushed oats. Use plenty phosphatic manure on the land, and the herbage will then satisfy the cows. A mixture of $\frac{1}{2}$ lb. sulphate of iron, 20 lbs. salt, and 15 lbs. bonedust will make a good "tick" for them. —GEN. SEC.]

FEEDING AND TREATMENT OF HORSES.—Members are agreed that horses should be warmly stabled in the winter, should be well groomed, and stables kept clean and dry. Each horse should have a loose box in which it can have liberty to move about, instead of being tied by the neck. Tied-up horses are liable to be choked through rolling or lying down at night. Mr. Childs thought it unwise of farmers to buy bran and pollard when they can grow oats, which are more nutritious. Oats will improve land affected by "takeall" to a great extent. Members all agreed that oats should be crushed as food for horses.

Pyap, March 13.

Present—Messrs. J. Harrington (chair), C. Billett, B. T. H. Cox, W. Axon, J. Holt, H. Mills, J. Napier, A. J. Brocklehurst, E. Robinson, J. F. Bankhead, and W. C. Rodgers (Hon. Sec.).

SEED EXPERIMENTS.—Mr. Bankhead found short green cucumber a very good variety, yielding well; watermelons failed. Mr. Cox found Cole's Early and Peerless watermelons very prolific, though late.

BIRDS.—Considerable discussion on the birds of the district took place. Many kinds were mentioned, and a general crusade against those which injure the fruit was advocated. The subject was considered of sufficient importance to justify very careful observation on the part of the members, in order to ascertain which birds were injurious and which beneficial and deserving of protection.

EXHIBITS.—Samples of apricots grown and dried by the Pyap Village Association; these were of high quality. Dried peaches from Renmark, also local sample of high quality. Raisins grown and dried locally were also first class.

Orroroo, March 15.

Present—Messrs. W. S. Lillecrapp (chair), J. Moody, M. Oppermann, G. Matthews, W. Robertson, and T. H. P. Tapscott (Hon. Sec.).

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the year ten meetings had been held, with a fair average attendance. Two papers were read, and a number of practical discussions have taken place. The visits of the Dairy Instructor has proved of considerable benefit to the district. The season, unfortunately, was again dry, and this, together with the ravages of the locusts, which took fully half the crop grown in this neighborhood, has given the farmers a severe blow. The importance of the smaller industries to

the farmers was again emphasised. The Secretary believed that the introduction of the seed and fertiliser drill in this district would prove a distinct advantage. He urged members to show their interest in the Branch by reading papers, attending regularly, and taking active part in the discussions. He also suggested the practice of holding homestead meetings. Members had met at his farm, and he was sure that if others would follow his example, the opportunity of inspecting the crops, stock, buildings, &c., would be generally appreciated by the members, and much useful information would be gained. Messrs. W. S. Lillecrapp and T. H. P. Tapscott were re-elected Chairman and Hon. Secretary respectively, and thanked for their services in the past.

FOWL TICK.—Mr. Lillecrapp asked if any member knew of a sure cure for fowl tick. Mr. Matthews thought the best plan was to have two houses, using them alternately, so that they could be thoroughly fumigated at intervals. Mixing fat and kerosene well together, and rubbing it all over the perches to fill up cracks and holes, was a good plan. Several members took part in the discussion, but none could recommend any positive cure.

WHEAT EXPERIMENTS.—The Hon. Secretary tabled samples of several different wheats grown from Bureau seeds. Owing to the damage done by locusts during past two or three years these had not received a fair test, but some were promising enough to justify further trial.

Johnsburg, March 2.

Present—Messrs. G. H. Dunn (chair), F. W. Hombsch, T. A. Thomas, L. Chalmers, T. Johnson (Hon. Sec.), and one visitor.

RABBITS.—A discussion on this subject took place. Members thought that owing to united action on the part of the landowners, and the stringent measures taken by the local council, the rabbits had been considerably reduced in numbers, and the surrounding country was fairly clean. The Chairman urged members to use every effort to keep the pest well in hand during the early winter. He found phosphorus baits the best at this time of the year, although rabbits might perhaps take arsenic or strychnine more readily.

FERTILISERS.—Some members stated their intention of putting in small areas with the seed and fertiliser drill, to test whether it will pay to use fertilisers in this district.

Port Lincoln, March 15.

Present—Messrs. W. Laidlaw (chair), W. E. Goode, J. D. Bruce, J. P. Barraud, Jas. O'Shanahan, R. Puckridge, and Jas. Anderson (Hon. Sec.).

EXPERIMENTS WITH MANURES.—Several members reported on the use of manures last season. Mr. Bruce sowed two parts of his land, using Kangaroo Brand guano on one, and guano from Smith's Island on the other, at the rate of 70lbs to 80lbs. per acre in each case. The results turned out equal, reaping 17½bush. to 18bush. per acre, and a good sample weighing 67½lbs. per bushel. He found that drilled wheat stood up better than broadcast. His neighbor, with equally good land, sowed broadcast without manure, and reaped only 8bush. per acre. Mr. Goode used Kangaroo Brand guano, at the rate of 60lbs. per acre on old land, and 80lbs. on new land, sowing oats, wheat, and barley. He reaped 40bush. of oats per acre, and wheat averaged 16bush., some going as high as 24bush. The varieties of wheat were King's Early, Steinwedel (giving highest returns), Big Purple Straw, and White Tuscan. Barley was a failure, only seven bags from eight acres being reaped from land which yielded heavily last year. Mr. O'Shanahan experimented with Kangaroo Brand guano

and Bally bonedust, at the rate of 100lbs. and 50lbs. per acre respectively. He drilled 45lbs. per acre of wheat in each case. The guano gave best results, yielding 15bush. to 16bush. per acre, while the plot treated with bonedust yielded only 8bush. to 9bush. per acre. The varieties of wheat were Steinwedel, King's Early, and Early Para. Steinwedel gave the best result; Early Para was not good, excepting for hay. Mr. Puckridge used about 150lbs. of local guano to the acre, sowing White Tuscan, Big Purple Straw, Steinwedel, Leak's rust resistant, and a small amount of King's Early. On fallowed land Leak's rust resistant yielded 23bush. per acre, and Steinwedel 20bush. On cropped land not fallowed Big Purple Straw yielded 11bush. per acre, and White Tuscan 8bush. King's Early was very poor, and went down badly. One strip of the Purple Straw was drilled with Globe super., and gave 16bush. per acre. He sowed one and a half acres of field peas with about 60lbs. guano per acre, and reaped fourteen bags. Mr. Barraud put very little in, and got poor returns through too much wet. On fifteen acres for hay he put 2 tons of Kangaroo Island guano (over 2½cwt. per acre), and reaped 15cwt. per acre. His currant crop yielded very well this year, with a beautiful sample of fruit.

CATTLE DISEASE.—Mr. Puckridge reported a disease amongst cattle in his district. They are first affected by a stiffness about the fore-quarters, not being able to move. They object to drink water, are very costive, and if neglected at this stage they lose the use of the lower jaw, and are unable to bite or eat any food. The mouth remains open with the tongue hanging out, and a running from the mouth continues. If they arrive at this stage they are certain to die, but if treated when the stiffness is first noticed, by giving 16ozs. to 20ozs. of salts, and good injections of warm water, followed by drenching with plenty of thin oatmeal, they soon begin feeding again and improve, and finally regain the use of their limbs. He states that all that have not had this treatment have died, while those that have had it recovered.

Bakara, March 1.

Present—Messrs. R. Barrow (chair), R. Wilson, J. V. Barrow, J. Seidel, E. Wall, F. E. H. Martens (Hon. Sec.), and three visitors.

SEED WHEATS.—A discussion took place upon the best wheats for corn and hay. Mr. Barrow considered Purple Straw was the best variety for hay, whilst Mr. Seidel favored Club Head. The general opinion was that for early sowing Dart's Imperial, Purple Straw, and Club Head were the best varieties for the district, and for late sowing Early Para was best.

WHEAT EXPERIMENTS.—Mr. Seidel reported on the results from seed distributed by the Central Bureau last year. About 3ozs. of each variety were sown, and the returns are as follows:—Marshall's Hybrid, 9½lbs.; Majestic, 7lbs.; Ranjit, 9lbs.; and Silver King, 5lbs.

DISEASE IN POULTRY.—Mr. Wilson reported disease in the poultry which caused the heads and eyes to swell and the fowls to finally die.

Narridy, March 3.

Present—Messrs. J. Darley (chair), J. Liddle, F. Easther, D. Creedon, J. Smart, and T. Dunsford (Hon. Sec.).

GLADSTONE CONFERENCE.—Delegates to conference reported on proceedings. Mr. Jeffrey's address on sheep and wool was favorably mentioned by the Hon. Secretary. Mr. Darley was opposed to the suggestion that the Agricultural College should be removed from its present situation, as the climate and soil were almost identical with a very large area of our wheat-growing country.

Balaklava, March 9.

Present—Messrs. P. Anderson (chair), G. Reid, A. Manley, W. H. Thompson, W. Smith, A. W. Robinson, A. Hillebrand, J. Vivian, E. Hams, W. H. Sires, W. Tiller, and E. M. Sires (Hon. Sec.).

IMPROVEMENT OF WHEAT.—Considerable discussion took place on report of visit to Mr. R. Marshall's experimental wheat plots. Some members thought it would be well to try the Manitoba wheats here, while others thought it preferable to endeavor to perfect the class of wheat we know suits the climate and soil. The Hon. Secretary said as far as he could see from reports in the papers, the flour from Manitoba wheats did not make really better bread than our own wheats, but would hold more water, thus enabling the baker to make a greater weight of bread from a given quantity of flour. If this was so it simply meant that the baker could sell his customers more water and less flour in the loaf of bread, so that the consumer lost by it. Members pointed out that Mr. Darling's statement that South Australian millers only made one grade of flour was not quite correct; the local mill, at any rate, made three grades. Mr. Robinson said half of the wheat he had sold to a miller this year was King's Early, and he seemed glad to have it. It might pay them to grow the harder wheats, even if they got less per bushel for them, as they were hardy, and an increased crop might make up for the decrease in the price. As the millers and wheatbuyers did not study the farmer he could not see why the farmer should be obliged to study any other interests than their own. Members thought a testing mill was much needed, and considered it strange that the Department after purchasing such a mill had not set it up. They were unanimously in favor of having the mill fixed up at the earliest possible opportunity. The Chairman said that some years ago he got a little Red Fife wheat, which did well with him. When he had a fair quantity he asked the local miller to test it for him, but he declined and advised him to feed it to the pigs. He had, therefore, given up growing the variety; but now he understood that Professor Lowrie was advocating the same wheat. If they grew it would the millers buy it?

Yorke town, March 16.

Present—Messrs. J. Koth (chair), A. Jung, T. Corlett, H. Hughes, G. Bull, J. Davey (Hon. Sec.), and one visitor.

SHEEP FOR FARMERS.—The Hon. Secretary read paper on this subject, to the following effect:—

I have had a good many years' experience with sheep, and know the difference between the sheep that will cut 10lbs. or 12lbs. of wool and the one that will cut only 5lbs. or 6lbs. Many farmers have a poor, weedy, miserable lot of sheep. Failure to get good sheep to start with, and neglect of careful breeding, are the principal factors in the degeneracy of their flocks. There was a time when only merino sheep were to be met with in the colony, but merinos will soon run down and get weedy if great care is not paid to the quality of the rams used and the careful culling of the ewes to breed from. They will show health and a good constitution by the bright color and elasticity of their wool, evenness in length and fibre. Examine most carefully those parts known to be weakest in these points, and throw out the most deficient. But not many of our farmers keep merinos now. Some years ago long wool was all the rage, and topped the price in the market. Hence the Lincoln was introduced for the purpose of crossing with the merino, and the first cross gave the class of wool which just suited the wool spinners, so all farmers who kept sheep wished to grow this wool. But too many of them, instead of getting good Lincoln rams, did not mind so long as it was not a merino and the price was low. Those going in for sheep for the first time purchased cross-bred ewes, not being mindful whether they were first, second, third, or any other cross, so long as they were long wool; and they got the same class of undefinable ram to breed from. Then the rams ran with the flock the year through. The consequence was that ewes of all ages and conditions were in lamb—old ewes that were not able to half suckle a lamb, and mother and lamb just managed to live,

both being half starved, resulting in poor stunted sheep. Then last year's unweaned lambs would be running with lamb at foot, which injures the mother. As years go on, with this want of management, the flock gets unprofitable, both for wool and in size of carcase as fats for the butcher. The wool from such sheep is short (as long wool), and very open, loose, and hairy, especially about the buttock, hence liable to get very earthy and deficient in yolk, which causes it to be lustreless and harsh to the hand, and the fleece is very light in weight, which means little or no money in it. For cross-bred sheep do not get away from first cross. Get the best merino ewes, with a nice even dense fleece and good frame; then get the Lincoln ram from a reliable stud breeder; do not leave the ram with the flock; pick out the ewes wanted and put them in a paddock by themselves. About the 1st of January is the best time to put the rams with the ewes. If put in too soon they will not work. Leave them with the ewes about two months, then take the rams out. There should be a little paddock near the home, and near water, to put them in. Have a trough in the paddock, put water in each day, and they will be of very little trouble. By working on these lines you will get a nice showy fleece of good weight, which will command top price, and a tip-top lamb or sheep for the butcher. Above all, do not overstock.

Mr. Corlett agreed that it was a great mistake to overstock. A few pet sheep he had cut from 16lbs. to 22lbs. Mr. Bull agreed with the paper; he found it, however, a hard matter to keep his sheep in good condition throughout the year, especially when wanted to keep the fallows clean. Other members had experienced the same difficulty. Mr. Hughes thought there was great need for farmers to exercise more care in the breeding and management of their sheep. Mr. Sherriff agreed with the paper, except that he would put the rams with the ewes in February.

Golden Grove, March 22.

Present—Messrs. J. R. Smart (chair), S. A. Milne, J. Ross, A. Robertson, F. Buder, J. Woodhead, and J. R. Coles (Hon. Sec.).

DAIRYING.—Paper read by Mr. Coles at January meeting was discussed. Members generally were of opinion that dairying on the lines indicated would not be profitable enough to enable a man to go in exclusively for it. Twelve or more cows, with calves and pigs, would occupy the whole of his time, while he would require assistance to milk them. It might be all right where there was a family to help, but if hired labor was necessary it would not pay. The Hon. Secretary regretted that the printed report of the paper did not bring out the spirit of inquiry that animated him. He was the only member going in exclusively for dairying, and he was anxious to know how and where he could improve his methods.

Angaston, March 2.

Present—Messrs. R. Player (chair), A. Salter, J. Heggie, J. H. Snell, A. Sibley, P. Radford, F. Thorne, W. Sibley, J. Vaughan, E. S. Matthews (Hon. Sec.), and P. Trimmer, Assistant Inspector of Fruit.

EXPORT OF APPLES.—Mr. Trimmer gave some valuable hints on best varieties of apples for export, and on packing, grading, storage, &c.

ANNUAL REPORT.—The Hon. Secretary's report showed that during the year ten ordinary and two special meetings had been held, with an average attendance of nine members; six papers had been read and discussed; and visits paid to the Barossa Waterworks and to Seppeltsfield. Messrs. F. Thorne and E. S. Matthews were elected Chairman and Hon. Secretary for ensuing year.

CO-OPERATION.—It was decided to call a meeting of fruitgrowers to consider question of co-operation.

Woodside, March 11.

Present—Messrs. R. Caldwell (chair), A. Lorimer, A. Pfeiffer, J. C. Pfeiffer, R. P. Keddie, N. Schroeder, W. Rabach, R. W. Kleinschmidt, J. D. Johnston, G. F. Lauterbach, C. W. Fowler, A. S. Hughes (Hon. Sec.), and R. Crowe, Victorian Dairy Expert.

DAIRYING.—Mr. Crowe gave a very interesting address on dairying in Victoria, imparting a considerable amount of useful information. A vote of thanks was accorded to Mr. Crowe for his visit.

Murray Bridge, March 6.

Present—Messrs. J. G. Jaensch (chair), R. Edwards, A. Kutzer, J. Stacker, and W. Lehmann (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. Stacker reported that Silver King wheat did not prove equal to other wheats grown in the district. Mr. Jaensch reported Marshall's Hybrid a failure. The Hon. Secretary sowed Rangit wheat alongside Purple Straw, placing it over three holes in the drill and sowing it right across the field. The Purple Straw was severely bleached in patches, but the Rangit alongside was unaffected by the heat, and was 6in. higher, having a long large grain. It was worth a further trial.

EXHIBITS.—Mr. Stacker tabled several kinds of grapes grown on his land, which is of a sandy nature, with limestone bottom. The grapes were very fine, and the bunches large.

Arthurton March 14.

Present—Messrs. W. H. Hawke (chair), J. Pearson, M. Baldock, H. Baldock, P. Lamshed, and J. B. Rowe (Hon. Sec.).

FIELD TRIALS.—Chairman reported proceedings at a recent meeting of the Southern Yorke's Peninsula Field Trial Society, the members of which were now of the opinion that it is advisable to dispense for a time with further trials. The society had secured a piece of land, free of cost, at Paskeville, for future trials and shows, and the Paskeville Branch of the Agricultural Bureau had undertaken to fence the same. Members were much pleased with all that has been done, and thanked the Chairman for his attendance.

HARVESTING WHEAT IN DOUGH STAGE.—Mr. W. H. Hawke remarked that much had been said about the advantages of cutting wheat in its dough stage—eight or ten days before it is ripe. Even at the latest Congress the subject had been discussed, but his opinion had been that there was not much in it. However, he determined to test the matter at the latest harvest, and cut a small sheaf eight days before harvest, and another each day after, until the crop was quite ripe. Those sheaves he placed inside a small stook of hay, and let them remain until harvest was over. He then thrashed them separately, and very carefully weighed 1oz. of wheat from each lot. Then he counted the grains in each ounce, and found that in the first 4ozs. there were 104 less grains than in the last 4ozs. [Showing that the earliest-reaped sheaves bore the heaviest grain.—GEN. SEC.] This result convinced him that, after all, there must be something in the reports that have previously appeared. He proposed to conduct the experiment on a larger scale next year. Mr. Pearson thought that, with all the extra labor it would involve, it would hardly pay to reap wheat in its dough stage and to thrash it out. The Chairman was heartily thanked for the trouble he had taken.

Port Elliot, March 23.

Present—Messrs. H. Welch (chair), J. Brown, H. Green, sen., W. E. Hargreaves, H. Pannell, C. Gosden, R. E. Ulrich, O. B. Hutchinson, H. Gray, and E. Hill (Hon. Sec.).

HOMESTEAD MEETING.—This meeting took place at the home of Mr. O. B. Hutchinson where the owner has just erected an irrigation plant, consisting of a 15,000gall. tank on a platform of 12ft. high, supplied with water from the Hindmarsh River by a Riddle's "Model" wind engine. The bank on which this stands is 20ft. to 30ft. above ordinary river level. When the tank is full the engine becomes automatically stopped. The water is carried by pipes to all parts of the estate where it may be wanted. Members were greatly interested and instructed by this work.

Naracoorte, March 9.

Present—Messrs. S. Schinckel (chair), J. Wynes, J. G. Foster, W. Buck, H. Hassler, W. Hastings, A. Caldwell, E. Thomas, and A. Johnstone (Hon. Sec.)

FIREBREAKS.—Chairman mentioned that his brother had seen a plough used in Victoria for making firebreaks, which turned a furrow 5ft. wide.

CONFERENCE.—Some arrangements were made with reference to the Conference of South-Eastern Branches, to be holden at Penola on April 24.

RABBITS.—Mr. J. G. Forster did not agree with a leader in the *Naracoorte Herald* averring that trapping had not been a success, and that rabbits were on the increase. He held that the numbers had been greatly diminished in the Morambro country. Trapping is the best way to keep down the pest. Three years ago Morambro carried only 22,000 sheep; now it carries 28,000, but they trapped systematically. The manager paid for scalps and kittens. Some stations would not allow trapping because the owners did not like to see the men making wages. Mr. Caldwell was glad to hear that the country was so clear of rabbits. It seemed to him that those owners who did not allow trapping were the true friends of the trapper, as they kept up the supply. He favored system in trapping and poisoning as well. The Chairman had tried paying extra fees to trappers, but found a large number of rabbits with broken legs, which had been liberated from the traps because not suitable for market. Mr. Wynes said he had no doubt rabbits were scarcer in Mr. Forster's country, as it was well known that rabbits always go southwards.

SHRIVELLED v. PLUMP GRAIN FOR SEED.—Mr. A. Johnstone read the following paper:—

The question of shrivelled wheat for seed purposes is one that has been frequently discussed, and some farmers have pronounced themselves in favor of it as against the plump or properly-matured grain. I cannot speak from experience in the matter of wheat-growing, but it strikes me that no plant can be successfully propagated from year to year from an immature parent. I admit that the wheat plant, if grown on rich land from shrivelled grain, may for one or two years give a fair return, as it so often occurs in nature, both in the animal and vegetable kingdom; that they go back to the grandparent, and so inherit in that way a worse or better stamina than they could derive from their last progenitor; but it would be very bad practice to continue sowing inferior seed if good is procurable. We all know that though the grain may be shrivelled and immature, still the germ of life in its centre may be fully developed; if it is so, then we get as good a sprout as we would from the plump grain. But the young wheat plant requires nourishment until it is able to draw for its subsistence from the ground, and if the seed has been shrivelled of course the substance is not there to impart that necessary nourishment to enable the embryo plant to produce a strong and healthy existence. I know from experience that vegetable and flower seeds when plump and well ripened always produce a more satisfactory crop than obtained if the seed is not in good condition, and, generally speaking, I have found that no amount of nursing will turn weakly plants into a satisfactory crop; and it comes to this: if the requisite stamina has not been sown in the seed bed we seldom reap satisfaction in the harvest. Let us take, for instance, the potato, which of course

is not properly speaking a seed, but a cutting with so many buds and eyes. Is it not the case that the crown eyes always send up the strongest shoots? Why? Because they are the most perfectly developed and are ready to monopolise all the life in the sett, and the larger in reason the sett is the stronger will your plant be. I am a believer in uncut setts for the reason that the ground coming in contact with the cut surface causes the latent germs of decay to set to work at once, and if the ground be wet the sett which has been cut does not last long enough to enable the young growth to set up a sturdy plant; in fact, it very often occurs that in moist seasons very many cut setts do not grow at all, whereas in the uncut sett excessive moisture does not cause a rapid decay, thereby allowing the full benefit of its constituents as food for the infant fruit. We know that nature's primary object in giving fruit is simply as a covering to protect the seed. As the seed within matures the fruit ripens, and when the seed has properly ripened the fruit decays and sets free the seed within, so that it may burst forth and take root in the ground. It is different in the case of wheat. The composition of gluten, starch, &c., outside is intended for more than a protection to the embryo plant inside. It is also meant to nurse it, and provide it with a certain amount of food until it is able to go alone. I hold that as in the animal kingdom so it is in the vegetable, and no farmer or breeder of stock would think of building up a flock of sheep or mob of horses from anything but the best sires and dams. Then why should they use immature seed, and especially in the production of that staple product and food of man—wheat? My advice would be—Feed your stock on the shrivelled grain (if you cannot sell it for a like purpose), and save nothing but the very best of everything grown on the farm; then you may with all reason expect to reap a good and bountiful harvest, all other conditions being equal.

Mr. Forster would put all seed through the drake sieve to remove all small seeds. Mr. Hassler's experience had been that plump grain gave best results; but Mr. Buck said he had secured better results from shrivelled grain—it was more free from disease. It was peculiar that self-sown wheat was never affected with bunt. The Chairman said it had been shown that bunt spores germinated in such cases and died out before the wheat started to grow. He advocated careful cleaning of seed. He had no doubt Dart's Imperial was the best wheat for the district. Mr. Wynes believed the thrashing machine cracked a deal of the seed, which prevented it germinating. Others said the damp-weather stripper cracked much grain.

Pine Forest, March 5.

Present—Messrs. F. Masters (chair), F. Masters, G. Inkster, and R. Barr, jun. (Hon. Sec.).

CONFERENCE.—Owing to conflicting notices with respect to the place of meeting of the Conference of Southern Yorke's Peninsula Branches on February 15th, some members went to Bute and others to Port Broughton, and the result was "a bungle." Members of this Branch are of the opinion that Bute is the most convenient and central place, and that next Conference should be held there.

FARM EXPERIMENTS.—Mr. F. Masters read the following paper:—

Every farmer should be an experimentalist; in fact, no farmer can afford to manage his farm without applying a test to the profitableness or otherwise of his work. The ambition of each should be, not merely to make his farm pay its way, but to make as large a profit as possible thereon. The only way of satisfying himself upon this point is by comparing his work with others, and check by experimenting when others have not done so under similar conditions to his own. But it is not always that the conditions on two adjoining farms are exactly alike; hence often we see quite different results from the same treatment, and this serves to emphasise the need of experimental work of our own instead of trusting to the experience of others. While this is so, yet it is often the case that one experiment will serve to teach the correct methods to a large district, and it is in recording agricultural experiments, the conditions under which they were conducted, and the results that our bureau system possesses one of its most useful features. In conducting experiments the utmost care is needed to ensure definite and final results. Accuracy in every detail is imperatively demanded, for often the neglect of one small point will render the whole of the trouble taken useless and unavailing. Nothing must be left to guesswork, but each point determined beyond all cavil by the closest observation and scrutiny possible. This latter is fatal to the experimentalist's work, and too often the

points which appear to the judgment and senses correct and certain fail beneath the scrutiny of accurate tests. Be not deceived by appearance, but exercise the most rigid check known to you. How often is the farmer deceived in his estimation of his wheat crop? Not seldom it is that the poorest-looking crop yields the best. The case of a member of a Branch Bureau who took some wheat to experiment with to test its suitableness for his district came under my notice. He sowed the wheat beside two wheats well known, and at harvest time instead of reaping them separately and verifying or otherwise the appearance by weighing, &c., reaped the whole together, and reported to the Branch that the wheat was no good. This may have been the case or not, but it was poor satisfaction to the Branch and certainly not justice to the wheat. How much better had he gone the full length of the test. Careless experimenting is not worth the trouble it takes. Patience and perseverance are required, and some knowledge of natural laws. This, combined with the exercise of a little common sense and care, is all that is needed. There is plenty of scope for our energy in the various departments of the farm. There are many moot questions in agricultural life, many points upon which the most hazy notions are held, but what we want is not opinions based upon speculations, but opinions proved by experiment. In this diversity of opinion only one view can be right, and if one man could point to a series of experiments, properly conducted, proving his theories, it would save much useless speculation. Foremost among the products of the farm in our district comes wheat-growing. All other departments are of a subordinate nature, and dovetail in with this mainstay—many of them dependent, or partially so, upon it. What are the best varieties to grow? One man says Steinwedel, one Rattling Jack, another King's Early, a fourth Purple Straw, and a fifth some other variety, and yet not one of them could tell you he had tested them together for a series of years. No; it is guesswork—measure by the eye. None of them probably had experimented to find the best time to sow each. Then, as to sowing; one man sows 60lbs. per acre, another 25lbs., a third 35lbs., and they all get about the same crop, but no one decides by testing the most economical quantity to sow, or whether large or small seed makes any difference. Of course they all drill in with manure; would not farm without it; it would not pay. Oh, no! So on it goes. Some 45lbs., some 70lbs., and some 1cwt. per acre, without ever a thought as to whether they are using too much or too little, or why they only put 40lbs., while so-and-so puts more, unless someone of them gets a bit uneasy, and begins to feel his purse strings, and makes an experiment or two, just to see where the land lies, and then he keeps it to himself. What we want to know is, what is the most economical dressing of manure? Then there is the herd of cows—probably seven or eight, perhaps more. They give a good lot of milk altogether, and make a fair amount of butter, and he is satisfied he has a good herd; but it never enters his head that three cows are giving the majority of the milk, and the duffers are getting the credit for it. This is the way plenty of farms are carried on, and if they would only make a few careful experiments they would soon find the bog they are in. Many a cow is judged by the quantity of milk she produces; yet, more often than not, the cow which gives less makes the most butter. Test each individual, and discard the unprofitable. So with each department of the farm. Let us check our work, and cull, select, and experiment continually. Let us not consider the time and expense taken in experimenting as wasted, for time and money could not be put to a better use, and if we are guided by the results of our experiments we shall be upon the high road to success in the management of our farms, for our work will then be upon a thoroughly sound basis.



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and found Employment by Government Departments and Private Employers from February 27 to March 29, 1901.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youth laborers	120	117	323
Carpenters	6	4	7
Bricklayers, masons, &c.	1	1	—
Boilermakers, blacksmiths, and assistants	5	2	10
Riveters, iron and brass moulders ..	1	—	5
Fitters, turners, and assistants	3	1	1
Enginedrivers and stokers	1	—	—
Apprentices	13	6	2
Cleaners	16	27	—
Carriage-washers and junior porters	18	14	12
Painters	12	—	17
Cook, baker, and assistant	4	1	2
Deck hand	—	1	1
Plumber, ironworkers, and assistant	1	—	2
Driver	—	—	1
Shipwright and wheelwright	1	1	1
Boiler cleaner	—	—	1
Miner	1	—	1
Tinmith	—	—	1
Farm hands	—	—	5
Patternmaker	—	—	1
Stonebreakers ..	—	—	10
Cameldrivers ..	—	—	1
Compositors	—	—	7
Wellsinkers	—	—	2
Chainmen	—	—	2
Rivet boys	1	—	2
Totals	204	175	417

March 29, 1901.

A. RICHARDSON, Bureau Clerk.

The Factories Act.

CONTRIBUTED BY CHIEF INSPECTOR BANNIGAN.

The Amending Factories Act, No. 752 of last year, having extended the provisions of both Acts to a very large number of places that were left untouched under the old Act, and many other important provisions being embodied in the new Bill, it may be useful to give a short *résumé* of the Acts in a blended form, in order that the law as it affects factories and other workplaces and workers may be more readily understood.

The additional provisions will not, however, apply to any place outside the boundaries of the electoral districts of North Adelaide, East Adelaide, West

Adelaide, East Torrens, West Torrens, Sturt, and Port Adelaide. In all corporations and manufacturing districts not included in the electoral districts mentioned above the principal Act will still apply.

It is provided that, except so far as inconsistent therewith, the amending Act shall be read as one with the Factories Act, 1894, which is sometimes referred to as the principal Act.

Within the area covered by the amending Act the word "factory" will now mean any manufactory, workshop, or workroom in which the owner employs anyone; and where the operations of any occupier are carried on in several adjacent buildings, the whole is to be treated as one factory.

All factories must be registered within twenty-one days from the date of going into occupation, with the date when the place first became a factory.

Any person occupying a factory or workroom not duly registered as in the Act provided, is liable to a fine not exceeding £10.

Every occupier of a factory intending to close and cease to use it must give the inspector seven days' previous notice in writing of such intention.

All factories are to be registered in an official list to be kept for the purpose, in manner prescribed by regulation.

The word "employ" applies to any manual labor exercised for purposes of gain in or incidental to making, altering, repairing, ornamenting, finishing, or otherwise adapting any article by way of trade, or for purposes of gain or for sale.

"Occupier" means the person, company, or association employing persons in any factory, and includes any agent, manager, foreman, or other person acting, or apparently acting, in the general management or control of any such factory.

"Parent" means parent, guardian, or person having the custody of or control over any young person or child.

"Woman" means any person of the female sex over the age of 16 years.

"Young person" means a boy or girl between the age of 13 and 16 years.

"Child" means a boy or girl under the age of 13 years.

"Apprentice" means any person under 21 years of age bound by indentures of apprenticeship, or employed under a written agreement, signed by the employer on the one part, and such person or his parent or guardian on the other part, under which such employer agrees to employ such person, and such person agrees to work for such employer, for not less than one year.

"Improver" means any person (other than an apprentice or person incapacitated by reason of old age or physical infirmity) who does not receive, and who is not entitle to receive, a piecework price or rate, or a wages price or rate, fixed by any board for persons other than apprentices or persons so incapacitated as aforesaid.

"Inspector" means an inspector of factories appointed under the Act.

A Chief Inspector of Factories has been appointed, who will have charge of the department, and to whom all notices and returns must be sent.

An additional inspector of factories will be appointed, who will be a qualified mechanic, and, although one of his principal duties will be to report on such machinery or structures as in his opinion may be dangerous to human life or limb, he will also make general inspections of all factories and workshops coming within the scope of the Factories Acts.

All other inspectors of factories may still exercise authority with regard to the safeguarding of dangerous machinery under the principal Act, none of the provisions of which have been repealed.

The inspectors have been empowered—

- (1) To enter, inspect, and examine, at all reasonable times, any factory and every part thereof, and to enter by day any place which they have reasonable cause to believe to be a factory :

- (2) To inspect and examine machinery in any factory, and to give such directions as they may consider necessary or proper for the safeguarding of dangerous machinery, and for protecting the life and health of persons engaged in the working thereof:
- (3) To make such examination and inquiry as may be necessary to ascertain whether the provisions of the Act, and of all laws and by-laws relating to public health, are complied with so far as respects the factory and the persons employed therein, and to report to the Central or any Local Board of Health any breaches of the health laws thus ascertained:
- (4) To examine and question, with respect to matters under the Act, every person whom they find in a factory, or whom they have reasonable cause to believe to be, or to have been, within the preceding two months employed in a factory, and to require such person to be so examined, and to sign a declaration of the truth of the matters respecting which he is so examined: Provided that no person shall be compellable to answer any question asked by the inspector which may tend to incriminate the person questioned:
- (5) To require the production of any book, notice, record, list, or document which is by this Act, or the regulations thereunder, required to be kept or exhibited in any factory, and to inspect, examine, and copy the same:
- (6) To require the production of, and to inspect, examine, and copy all pay-sheets and books wherein an account is kept of the actual wages (whether by piece or not) paid to any employe in any factory or workshop to which the determination of any board applies. [In making any authorised entry, inspection, or examination any inspector may take with him any assistants authorised in writing by the Minister]:
- (7) To exercise such other powers and authorities as may be necessary for carrying the Act into effect as may be conferred upon them by regulations:
- (8) Every inspector under the Act shall be furnished with a certificate of his appointment, and on applying for admission to a factory, or workshop, or any place which he has reason to believe to be a factory or workshop, shall, if required, produce to the occupier the said certificate.

The powers of the inspectors extend to the giving reasonable directions for the proper means of escape from any factory in case of fire.

The occupier of every factory, his agents, and servants shall, at all reasonable times, furnish the means required by any inspector necessary for any entry, inspection, examination, and inquiry, or the exercise of his powers under the Act in relation to such factory

Any person obstructing any inspector in the execution of his duties under the Act, or omitting to comply with the requirements of section 10, or of any direction which the inspector is authorised to give pursuant to the Act, or to truly or reply to any question or enquiry which any inspector is authorised to ask or make under section 8, is deemed to have committed a breach of the Act.

Every person who wilfully delays an inspector in the exercise of any power under the Act, or who fails to produce any book, notice, record, list, or document which he is required to produce, or who directly or indirectly prevents any person from appearing before or being examined by an inspector, or attempts so to do, shall be deemed to have committed a breach of the Act.

(To be continued.)

Journal of Agriculture

AND

Industry.

No. 10. REGISTERED AS

MAY, 1901.

[A NEWSPAPER. Vol. IV.]

NOTES AND COMMENTS.

April has been a disappointing month. The weather has remained extremely dry on the whole, and in many districts the herbage brought on by the March rains is rapidly failing. In the northern districts feed is extremely scarce, and farmers are removing their stock to pastures further north, which are carrying good feed as a result of the soaking rains experienced a few weeks since. Seeding operations are being vigorously proceeded with, but have been delayed by the dry weather and the difficulties experienced in obtaining fertilisers. The area of manured wheat land will doubtless show a very considerable increase again this year. A good general rain would be exceedingly welcome; in fact, unless it comes very soon it is feared that a large amount of seed sown will malt in the ground.

In last month's issue it was announced that experiments would be conducted in several places in the so-called "Ninety-Mile Desert," to prove that, with the use of proper fertilisers, a considerable area of that locality can be made to produce profitable crops of cereals, if not of other marketable products. The matter, however, seems to have been left too late in the season to secure satisfactory results, as the plots would have first to be cleared of bush growths, then ploughed, seeded, and manured, and next fenced and rabbit-proofed. It is now proposed to have five or more ten-acre plots got ready for experimental purposes next year. Several settlers in the "Desert" have already proved that cereals, vegetables, and fruits can be grown there; but it is always claimed by pessimists that these results are due to "exceptionally favorable circumstances."

Last year the series of articles on pruning of fruit trees, written for this *Journal* by Mr. George Quinn, were reprinted in pamphlet form, and met with such demand that the issue was soon exhausted, and several hundreds applicants were disappointed in their desire to obtain a copy. Mr. Quinn is at present revising the articles, and also enlarging their scope. A considerable number of new photographs, illustrating the methods of pruning of various fruit trees, have been secured, and it is hoped that the revised pamphlet will be published about the end of May. The price will be the same as last year, viz., 1s. per copy. Postage will cost 2d. per copy. Applications for copies may be made to the Agricultural Bureau, Adelaide.

A telegram from Tasmania conveys the information that the dreaded San Jose scale has been found on hundreds of fruit trees in the New Norfolk district. This will be bad news for the Tasmanian growers, but as the remedial action necessary is well known there is little doubt that vigorous measures will be taken to deal with the pest. The telegram further states that "the pest is supposed to have been introduced from South Australia with some cuttings obtained a few years since." As the San Jose scale has never been found in any South Australian orchard, very little weight can be attached to this statement of the supposed channel of introduction. As far as is known our regulations dealing with the importation of plants and fruit have effectively prevented the introduction of the scale into this State, although it has existed in at least three of the neighboring States for several years.

The Hon. Minister of Agriculture having refused to accede to the request of some of the fruitgrowers and hawkers round Adelaide that the regulation prohibiting the sale of codlin moth infested fruit should be repealed, a move is now being made in another direction with the same object in view. At the April meeting of the Central Bureau Mr. T. B. Robson moved that the regulations should be repealed, characterising them as worse than useless and an utter failure. As will be seen from the report in this issue, the Central Bureau intends to hold a special meeting to consider the matter. The question as to whether the infested fruit should be allowed to be distributed without any check, and all efforts of the Department to save the free districts abandoned, has now reached a crisis. Up to the present it may be said that the officers of the Department, who are not financially interested in the matter, have had to fight for the interests of the free districts, and those growers who believe in restricting the sale of infested fruit, without much public support from those most interested. Though the officers know they have the support of a very large number of fruitgrowers, the agitation of other growers has influenced public feeling to a large extent, and considerable sympathy was expressed for those growers who have been prosecuted for selling infested fruit. It is evident that those who believe that the apple-growing industry will be seriously affected by repealing the regulations must take active measures to bring their side of the case before the public. If they allow the matter to slip now they will only have themselves to blame if the agitation for the repeal of the regulations is successful.

In considering the advisableness or otherwise of allowing the sale of fruit infested with codlin moth caterpillars, there are really three separate parties interested. First, the growers who have been demanding to be allowed to sell their fruit irrespective of whether it is infested or not; second, the growers who believe that energetic action will keep the pest within bounds, and that the sale of "wormy" fruit will result in great injury to the industry; and third, the consumer, whose interests appear generally to be overlooked. The opinions of the consumers can to a large extent be ascertained from the principal fruit shops in Adelaide and elsewhere. Speaking from experience, we believe that the majority of shopkeepers, who have to study the interests of their customers, have a marked objection to the infested fruit being foisted upon them, and we believe that the majority of the consumers of apples and pears will resent, in a manner that will react on the grower, the repeal of the regulations, notwithstanding the fact that at present large quantities of infected fruit are deliberately foisted upon the unsuspecting buyer by unscrupulous

growers and hawkers. When the consumer has been defrauded in this way he does not usually rush into print, but very often settles the matter very simply—by refraining from purchasing further supplies.

Pear-leaf blister mite (*Phytoptus pyri*) is very prevalent in this State and often does considerable injury. Up to the present little success has attended the efforts of gardeners to cope with this pest owing to the difficulties of dealing with it once it gets in the tissues of the leaf and fruit buds. Dr. Eleanor A. Ormerod and Dr J. Fletcher, the Canadian entomologist, state that kerosene emulsion has, up to the present, proved a most effectual remedy. The best time to attack the mites is when they are in their winter quarters in the terminal winter buds. One or two sprayings with strong kerosene emulsion after the leaves have fallen and before the buds have begun to swell in the spring have given very satisfactory results. The emulsion should be made of one part kerosene to five to seven parts water. Fallen leaves should be gathered and burnt.

The paper by Mr. J. Flower, of Onetree Hill Agricultural Bureau, printed in this issue, is worthy of thoughtful consideration by all farmers keeping sheep. Hay at present is worth about £1 per ton in the stack, and Mr. Flower contends it will pay to feed it to sheep when the feed becomes dry. He has kept 300 sheep for four months on a diet of 1lb. of chaff per day, in addition to what they have picked up on 200 acres of stubble land. When purchased in November they were very poor; now 90 per cent. are fit for the butcher. Taking these results as a fair average, the members of the Branch state that feeding a flock of 700 sheep on chaff for four months would result in a minimum profit of £100. Every sheepfarmer has experienced the difficulty referred to by Mr. Flower of keeping the sheep in good condition after the best of the dry feed or stubble has gone. The practice of feeding chaffed hay to sheep on the land has an indirect but important advantage not referred to by Mr. Flower, and that is, instead of all the fertility represented in the hay being sold off the farm, a considerable proportion is returned to the land in the droppings of the sheep.

It is stated that during the drought a large number of breeding ewes on the Burra Burra run were kept alive on soaked maize. A large quantity of maize was purchased and fed to the sheep at the rate of 4ozs. per day. The sheep took readily to the new food and did well on it. The manager contends that the advantages of maize over hay chaff are its superior feeding value and ease of carting and feeding. The cost is about the same in each case. To prepare the maize a few half-filled bags are soaked in a pit for twenty-four hours, by which time the maize has swelled until the bags are nearly full. They are taken to the field in a small cart, and a constant stream of grain allowed to fall to the ground. After a day or two the sheep know the cart and crowd round. Every grain is eaten up, whereas with smaller grains like wheat or oats probably a considerable quantity would be lost. The price of maize locally is 4s. 3d. per bushel of 56lbs. At 4ozs. a day a flock of 100 sheep could be kept for four months at a cost of £10 15s. 9d. An interesting comparison can be made between these figures and the results obtained by Mr. J. Flower in feeding 1lb. chaff daily to his sheep.

Mr. H. Faber, the Commissioner of the Danish Government, in London, says the use of boracic acid in butter is prohibited by Danish law, and there is no likelihood of its use being permitted. Danish butter keeps without it, as it is well made and clean, and the boracic acid would not enhance its keeping quality unless used in such quantities that, according to the view of the Danish authorities, would be injurious to health.

The importance of shelter for all stock, but especially dairy cattle, during the winter months, is fully acknowledged by all thoughtful stockmen. A very considerable portion of the food consumed by stock is expended in the maintenance of the natural heat of the body, and the colder and bleaker the conditions the greater the proportion of food required for this purpose. It is economy to provide stock with plenty of shelter, as a greater proportion of the food consumed will go to making meat or milk. Dairy cows in particular require shelter during the winter, even in our warmest districts. If this shelter is provided by means of growing timber or sheds it will only be availed of when required, and will not in any way interfere with their hardiness. One or two large dairymen in this State provide every one of their cows with cover made of wheat bags or similar material, and their experience is that the increased yield of milk amply repays any trouble and expenses incurred in this way.

Has it occurred to the minds of many of our farmers that not only the general health of their live stock may suffer from the deficiency of certain substances in the soil, and, consequently, in the herbage, but the products, such as wool, cheese, butter, bacon, and even eggs and poultry, may and do suffer from absence of quality in all directions? Well-nurtured, wholesome plants used as food by farm animals will produce high quality, flavor, &c., in all the farm products. Of course where the soil contains a sufficiency of potash, nitrogen, and phosphoric acid, it would be wasteful to supply any; but it is very important to find out whether there really is a sufficiency, and if not, then to supply it.

The municipality of Kalgoorlie has opened city markets for daily sale by auction of all kinds of farm, garden, and dairy produce. A charge of $7\frac{1}{2}$ per cent. is made on all sales of produce effected within the market buildings, 10 per cent. on poultry, and $2\frac{1}{2}$ per cent. on truck lots of produce on the railways. These charges include cost of advertising and sale, and all the business is conducted under supervision of the municipal council by Mr. M. Eastwood, an early student at our Roseworthy Agricultural College.

It should be well known that fruit can be preserved for very lengthened periods without any sugar or other matter by simply boiling it until it will not run (when cold) from a vessel turned on its side or when it is as thick as newly-made glue. Californians are "condensing" apricots and other fruits, making the pulp into blocks, which are packed in "cartoons" (cardboard cases), and sold in the grocers' shops in the States, or exported to other countries. Any kind of fruit may be simply mashed and evaporated to such a consistency that it will not run, and the product will keep good for years. The celebrated "apple butter" is made thus:—Press out the juice from a bushel of apples,

start it boiling in a large cauldron, begin slicing in apples, continue doing so from eighteen to twenty-four hours, boiling all the time and stirring continuously with a pole; the last apples should have twenty minutes' stirring. The "butter" will keep good three years.

Miss Eleanor Ormerod, F.R. Met. Soc., F.E.S., &c., has completed her "Twenty-fourth Annual Report of Injurious Insects and Common Farm Pests," 1900, a copy of which that talented lady has forwarded to this journal. Those who have followed Miss Ormerod's valuable, patriotic, and gratuitous labors in this at first almost unexploited field of scientific inquiry, whilst recognising the magnitude of the benefits derived from her labors, will probably rejoice that so much has been achieved, that so many younger students and others have entered upon the same field of labor, and that in consequence the author feels herself justified in retiring from the arduous work which she voluntarily took up and so ably conducted for so long a time. It is unnecessary to repeat that this twenty-fourth report is equal, if not superior, to any previous report that has been published.

Part III. of "Destructive Insects," by Charles French, F.L.S., F.R.H.S., Economic Entomologist to the Victorian Department of Agriculture, price 2s. 6d., has just been published, and contains more information, more and better-colored illustrations than even the two preceding numbers. The illustrations comprise twenty plates of destructive insects and their insect enemies, eight insectivorous birds, and a number of uncolored plates of spraying-machines. The work also contains (in addition to full descriptions of each of the insects and birds illustrated) a copy of the Victorian Vegetation Diseases Act, remarks upon its working and effect, and descriptions of the various insecticides, founded in some cases upon the usual exaggerated "claims" made by the vendors, instead of upon the practical experience which the incessant urgent calls upon the time of the author has not allowed him to acquire.

The water hyacinth (*Pontadecro crassipes*) has taken possession of the freshwater portion of the Brisbane River, Queensland, and some idea of its dangerous nature as regards navigation was afforded on March 27th when a flood brought down thousands of tons of the plant from the upper river and creeks, almost blocking the navigation and causing a deal of trouble to ferries and vessels of all descriptions. It is fortunate that the water hyacinths cannot live in salt water, and that the inconvenience can only last for a short time. It must not be forgotten that this pest already exists on some of the tributaries of our Murray river, and that there is serious danger of a total stoppage of navigation on our only navigable stream within a very short time.

SCHOOL GARDENS.—In Russia, France, and many of the European continental countries, there are innumerable public schools which have gardens attached, partly for the use and comfort of the teachers, but chiefly for the education of the pupils in everything pertaining to rural industry. Pigs, bees, pigeons, fowls, rabbits, in many cases are also kept, and the children are taught in everything pertaining to their management. At certain periods each year the youngsters are examined by well-qualified officers, and credits are awarded both to pupils and to their teachers.

THE VINEYARD.

SEASONABLE NOTES.

BY ARTHUR J. PERKINS, GOVERNMENT VITICULTURIST.

The 1901 vintage, the first of the new century, will, I believe, be long remembered as one of the most remarkable on record. True, in South Australia, vine-growing is as yet in its infancy, and in years to come we may well look forward to far heavier total returns from this promising industry; but it is questionable whether similar results will be repeated within the experience of the present generation. For a succession of years the vines have been severely tried by drought, and finally in 1899 the greater part of the fruit-bearing shoots were destroyed by an exceptionally severe and late October frost. During the last pruning season the plants were smothered with apparently useless water shoots, and at that time the chances of the 1901 vintage looked anything but favorable. Until very recently I was not inclined to look forward to even an average vintage; and, basing my opinions on what appeared to me to be rational induction, in these notes I warned growers against the anticipation of heavy yields. But as "the plans of mice and men gang aft a-gley," so apparently with the best-founded inferences.

It is a generally accepted principle—it might almost be said to be a demonstrated fact—that the vintage of any given season is developed and formed, not during the season itself, but during the one immediately preceding it, and that conditions adversely affecting the growth of the plants during this preceding season must necessarily equally affect the vintage of the season immediately following it. A severe late frost, such as visited us in October, 1899, followed on by an exceptionally dry summer, must certainly have had an extremely weakening effect on the vines—and, be it said, a previous succession of dry years did not appear to have left them with any superfluous vigor to spare—effectively, in most cases the pruning wood was extremely poor, and where stronger, consisting mostly of usually barren water shoots. From such a state of things I thought I could legitimately predict a poor vintage in 1901, and a good one in 1902. *Peccavi*, unquestionably, but it seems difficult to trace out the source of my error. The crop on the frost-bitten vines was certainly light, and in certain cases even nil in 1900, and it is probable, in consequence, that, relieved of the heavy task of forming and developing fruit, the wood, however miserable in appearance, had better-formed buds and a greater store of reserve materials than would otherwise have been the case. Remain, however, the anomalous fruit-bearing water shoots. Perhaps the frost so modifies the general economy of the plants as to render these otherwise barren shoots capable of bearing fruit; perhaps, after all, they are not true water shoots, but shoots springing from the latent base buds of imperfectly removed previous year's wood.

It is difficult to form an accurate estimate of what the total yield of the State will run into, but I think it may safely be inferred that it will equal, if not exceed, the highest hitherto recorded. The heavy summer rains that visited most of our vine-growing areas in January contributed no doubt largely to this satisfactory state of affairs.

It may not be amiss to point out here that the Statistical Department is at present collecting figures for the 1900 vintage, and that those referring to the vintage lately gathered in will probably not be available until November, 1902.

The Phylloxera Inspector, Mr. H. Lowcay, will soon have completed the examination of as great a portion of our vineyard area as he could cover in a year. It is satisfactory to be able to state that he has hitherto met with no signs of the dread pest within this State. This is a rather convincing answer to some of our Victorian and New South Wales friends, who appeared to think that because South Australian vineyards had not been systematically inspected the pest no doubt existed there—had, in fact, been introduced thence into Victoria some fifteen or sixteen years ago.

I have heard it stated on good authority that it is the intention of the leading winemakers of the Tanunda and Angaston districts to offer a very substantial prize for the best cultivated vineyard in the district. This is certainly a step in the right direction. It is to be hoped, however, that the judges will not merely award the prize to the cleanest vineyard, but to the one that has received the most thorough and rational cultivation. In these districts more than in any others growers are particularly remiss in the matter of good winter cultivation; and if the yearly award of such prize would succeed in curing them of this fault it will do much towards raising average local yields. The first ploughing, on a good deep furrow should be started during the present month. Where vines are trellised it will not be necessary to await the pruners, part of the work can well be done before the plants are touched, and completed subsequently after the pruning.

. . .

. . .

. . .

Pruning need not be delayed until the complete fall of the leaves; it should be put in hand as early as possible, so as not to interfere with tillage operations. As soon as the wood is ripe, that is to say, hard and firm throughout, the plants may be pruned without danger. If calm weather prevails the leaves often remain attached to the plants for some time after the ripening of the wood. Let it be remembered that, in view of the fact that the greater part of our rain falls in winter, the plants will benefit more by an early opening up of the soil than they would be likely to suffer from perhaps slight premature pruning. It is unnecessary to add that the work should be clean and neat, and the system of pruning well adapted to the kinds of vines to which it is adopted. It is much to be hoped that, with the firming of prices and the return of better seasons, more systematic methods of trellising will gradually be adopted in some of the older districts.

PICKLING OLIVES.

There are several different methods of pickling olives, but the following, recommended by the California State Board of Horticulture, are said to be the best:—

Olives are pickled in four stages of ripeness—(a) green, before ripe; (b) reddish cast, when the olives have become a dark-red color before changing to black; (c) ripe, when the olives have become black; (d) dead ripe.

Green Olives.—The fruit is picked with care into lined baskets just as it has reached full size, and before indications of ripening begin, which is shown by tints of red forming on the fruit. After years of experimenting in the production of pickled olives I have obtained best results by pursuing the following course:—The olives are placed in shallow vats, which have previously been half filled with water to prevent any fruit from being damaged when being emptied into them. The vats are filled with fruit to about 75 per cent.

of their capacity. A lye solution is then made in another vat, either above the one containing fruit or near it. Fifteen pounds of pure potash, or Green-bank powdered caustic soda, are dissolved in a wooden tub containing from 5galls. to 10galls. of water. The potash or caustic soda is first placed in the tub and the water added. If the soda be used the water must be cold; if the potash be used the water must be hot. The soda generates great heat, and readily dissolves in the course of a few minutes. In another tub is dissolved 6lbs. of lime, which is allowed to settle. The clear liquid is then drawn off and added to the lye. Water is then added to make in all 100galls. of solution. The plug in the vat containing the fruit is then drawn out, and the water in which the olives have been is allowed to run out. The fruit is then covered with the lye solution. The room must be darkened, and no current of air allowed to pass through it during the changing of the lye, for exposure to light and air will change the color of the fruit from green to a coffee brown. The fruit is kept in this condition until the bitter principle is neutralised by the lye, which varies, according to variety, from twelve to sixty hours. The lye is then allowed to run out, and immediately water is run in and the vat filled to the top. The water is changed every day for four or six days, until every trace of lye is removed, which can be told by testing. The fruit is cut with a knife, and if there is no lye around the pit it is then time to add the brine. At first it is best to put a light brine—6ozs. of salt to the gallon of water—on the fruit, because it prevents the fruit from discoloring or shrivelling. After the fruit has been thoroughly pickled and the color firmly set, so that it will not not discolor on being exposed, it is put into a stronger brine—made of 12ozs. or 14ozs. of salt to the gallon of water—and in three or four weeks it is ready for market.

The success in pickling green olives so that they will retain that delicate green color depends on the care and precision taken in running off the lye, the immediate covering of the fruit with the water, the darkened room, the prevention of draughts passing through the operating-room while the water is being changed, the purity of the chemicals used, and the care in making the brine.

Reddish Cast.—Olives of a reddish cast, or before fully ripe, are selected and pickled separately. If cured by the lye process they keep longer than fully-ripe fruit pickled by the same process; if cured by the water process they become greatly discolored owing to uneven ripeness. In pickling olives in this state of ripeness it is best to add to the lye solution the clear liquid of at least 10lbs. of lime to set the color.

Ripe.—This state of ripeness is indicated by the jet black color olives assume. The fruit must be perfectly sound, they must be picked from the trees by hand, and the trees gone over several times unless they be of a variety of even ripening. After having been assorted they are placed in vats half full of water to prevent bruising, and when three-quarters full the water is run off and the fruit covered with the lye solution. They are kept in the lye until the bitter principle becomes neutralised, which varies according to the variety, locality, soil, and climatic influences, &c. During the operation the fruit should be tested from time to time by taking out a few, washing in clear water, and then cutting the fruit with a knife. If the lye has only penetrated a short way they should be left longer in the lye, or until all trace of bitterness is removed. The lye is then run off and water run in immediately, which is changed every day or so until no trace of lye is found in the fruit. A light brine, made of 6ozs. of salt to the gallon of water, is then put over the fruit, in which the fruit is kept a week or more. This light brine is then run off and a stronger brine, consisting of 14ozs. of salt to the gallon of water, is put on the fruit. It is very essential that the first brine should be weak, as a

stronger brine tends to shrivel the fruit, which destroys its commercial value. After the olives have been in the last brine two or three weeks they are ready for market, and must be then put into specially-prepared brine. Olives grown in varied situations differ in bitterness, and it often happens that a second or third application of lye becomes necessary to neutralise the bitter principle in the fruit.

Mr. F. T. Bioletti, in Bulletin No. 123, issued by the University of California Agricultural Experimental Station, says:—

The successful production of pickled olives is a matter of experience, and depends almost altogether on the individual judgment and skill of the producer. No method can be given which is suitable to all cases, and the best method must be modified according to the nature of the olives to be treated. The following scheme, therefore, is to be considered as a mere outline, to be carefully adapted and modified by the operator at each stage of the process:—

Lye Process.—1. Place the olives in a solution composed of 2ozs. of potash lye to 1gal. of water for four hours. Repeat this once or twice, if necessary, to sufficiently remove the tartness. 2. Rinse the olives thoroughly, and replace the lye solution with fresh water. Change the water twice a day, until the potash has been removed from the olive, as judged by the taste. 3. Replace the water with brine, composed of 4ozs. of salt to a gallon of water, and allow to stand two days. 4. Put in brine of 6ozs. of salt to a gallon for seven days. 5. Put in brine of 10ozs. per gallon for two weeks. 6. Put final into a brine containing 14ozs. of salt to the gallon of water.

In order to make this process a success the following considerations should be kept in view:—

1. Great care should be taken not to allow the olives to come in contact with anything that will injure their flavor. The vats or other receptacles used for pickling should be perfectly clean, odorless, and tasteless. Earthenware is the best material, but it is usually cheaper and more convenient to use wooden receptacles thoroughly treated with boiling water and soda until they are sterilised and all taste of the wood removed. Any wood—such as pine—with strong taste should not be used. The vats should be provided with a removable wooden grating fastened 1in. or 2in. from the bottom, and a close-fitting, floating wooden cover to prevent access of air, which spots the fruit. On top of the vats should be placed a cover of thick cloth or of wool to exclude light and dust. Each vat should be provided at the bottom with a wooden spigot for drawing off the solutions. The thickness of the layer of olives should not be more than 2ft., or less with soft varieties.

2. Only the very best of potash lye should be used. Some of the brands of lye are so impure that it is impossible, without a chemical analysis, to tell within 40 per cent. how strong the lye solution actually is when made up. Greenbank lye has been found the most reliable, and may be considered as 100 per cent. pure when making up the solution. The length of time which the olives should be left in the lye, and the number of times the lye should be renewed, can only be determined by experiment for each variety and each locality. The object is to extract the tartness of the olive and at the same time to soften the skin sufficiently to allow the tart or bitter substances to be soaked out in the subsequent treatment with pure water. The tougher and thicker the skin of the olive, and the more intense the tartness, the longer must the lye treatment be continued. The lye is sometimes made twice as strong as recommended above, and the treatment correspondingly shorter, but the results are not so good. Just enough lye solution should be used to exactly cover the olives, and occasionally during the soaking some of the solution should be drawn off below and poured on top to ensure an equal treatment of all the fruit.

3. Only the very purest water should be used both for the lye solution and for the subsequent soaking. Canal and river water, or any water that contains a great deal of organic matter, should never be used unless it is practicable to boil it first. Distilled water—such as can sometimes be obtained by condensing the waste steam from a boiler—is the best, both on account of its purity and its greater extractive power, provided, of course, it be free from oily flavor. The length of time during which the soaking in pure water should be continued varies very much in accordance with the character of the fruit. If the olives are firm and show no signs of becoming soft it should continue until the tartness is sufficiently extracted. This will vary—usually between ten and twenty days. The moment that the olives begin to show signs of softening, however, they should be placed in weak brine, even though the tartness has not all disappeared.

What remains then can be extracted by the brine, which should be changed two or three times, as may be necessary. It is not necessary to change the brine quite so often as in pure water—once in two days being generally sufficient.

If the olives are soft at first before treatment with lye, or if they are of a kind that soften rapidly in the lye, it is necessary to use brine from the beginning, either immediately after treatment with lye or, in extreme cases, with the lye. This method, suggested by Professor Hilgard, has been used with marked success. The lye solution in this case should be made by adding 2ozs. of lye and 4ozs. of salt to each gallon of water. As the lye acts much more slowly when used in combination with salt, it may be allowed to stay on the olives for a longer time without injury—eight or twelve hours, or even more. In this way the lye solution tends to soften and swell the olives; the brine counteracts this, and tends to harden and shrink them. The shrinkage, which occurs when brine is used from the beginning on naturally soft olives, is not a disadvantage if not carried too far, as such olives are generally too watery to be palatable or to keep well. They can, moreover, if shrunk too much, be made plump again by a few treatments with pure water before being put finally into brine.

The first salting must be done very gradually and carefully in order to prevent shrinkage and wrinkling of the fruit. For this reason gradually-increasing strengths of brine must be used, as described, and the olives left long enough in each to be thoroughly penetrated.

In all these operations no sign of scum or slime should be allowed to accumulate on the olives, the vats, or the covers. This is of especial importance during the treatment with plain water. On the first signs of sliminess around the sides of the vats—where it appears first—they should be emptied and thoroughly brushed and scalded before replacing the olives.

Pure Water Process.—The best pickled olives are made without the use of lye, but this process is only practicable with olives whose tartness is easily extracted, and where the water is extremely pure and plentiful, and even then it is very slow and tedious. It differs from the last process only in omitting the preliminary lye treatment. The olives are placed from the beginning in pure water, which is changed twice a day.

TURPENTINE FOR PIGS.—Some of the leading American breeders make it a regular practice to give their pigs a little turpentine in their food once or twice a week. They claim that the administration of this liquid exercises a very beneficial influence on the appetite, and helps to keep the digestive functions in good order, especially when the animals have been heavily fed with a view to their preparation for show purposes.

ORCHARD NOTES FOR MAY.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The harvest of deciduous fruits is practically over, and the returns have been above the average of several years past. Some lines have been ruled by low prices, but on the whole I think better returns have been netted by our growers than by Victorian orchardists. The apple harvest has been good in most districts, and the sample, particularly of Cleopatra, very fine. Owing to the enterprise of several private firms, and the Government Produce Depot, 33,270 cases have been dispatched to Europe up to date. A large proportion of these was composed of the well-known Cleopatra. For the production of this apple our climate is unrivalled. Complaints of the presence of "bitter pit" are again to hand. Although no remedy has yet come to our knowledge, still the prevalence of this defect in large specimens of apples grown upon trees in a very vigorous condition gives us a clue what to avoid. When planting the kinds most subject to it, care should be taken to put them in well-drained fairly dry positions. Cleopatra, Esopus Spitzenberg, Scarlet Nonpareil, and Northern Spy are much prized sorts very subject to "bitter pit." I shall be glad at any time to hear if any *Journal* readers find other valuable kinds similarly affected year by year.

Now that the harvest has been gathered, the results of any experimental work should be known to the grower undertaking such, and as the season for pruning and planting is at hand, now is the time to utilise any knowledge thus acquired.

On walking through an orchard now, one cannot help noticing the trodden condition of the soil around the trees, due to the harvesting operations. Should the ground not be broken after the first rains, a crust will form upon this trodden surface, and the tendency is to cause the water to run out into the open spaces between the rows rather than soak in evenly.

In most districts as soon as the soil is sufficiently moistened it should be dug or ploughed roughly to admit the moisture evenly to the subsoil. This is also a good time to enrich the ground with farmyard manure or bonedust. If the former is not available, and the soil is light and lacking in vegetable matter, field peas could be ploughed in with the bonedust or without it. These will grow during winter, and when in bloom in early spring they will be turned under. This practice is finding much favor in Victoria of late years.

Taken generally, the late autumn is favored for setting out young trees of deciduous kinds. If the intending planter has not already secured his stock, no time should be lost in doing so.

Let me again advise the beginner not to buy bulk only. It should be remembered that a young tree with a large top must have a correspondingly large root system, and in lifting it much of this is left in the ground. Consequent on this the top must be reduced, and in the end no advantage over the medium-sized tree is obtained. Old, stunted, hardbarked-looking stock is also to be avoided. These have probably been lifted several times, and are dwarfed, and probably will always remain stunted unless the conditions are particularly favorable. In preparing the ground for young trees the subsoil should be broken, but not made to exchange positions with the surface soil.

If time will not permit of the whole of the area being subsoiled, spaces several feet square should be thoroughly prepared where each tree is to be put in. The remainder should be ploughed, and when the subsoil is soaked, say, in August, the subsoiling could be completed over the whole space. Whatever area is planted, do not put in a single tree without thoroughly preparing the soil. I believe neglecting to attend to this matter has been a source of great loss in the past. If the ground is very poor, a pound or two of

bonedust worked thoroughly into the soil where each tree is to stand will prove helpful. As a rule, however, this is not necessary.

Ties should be removed from buds inserted about February, otherwise constriction will ensue.

Stones of peach, apricot, plum, cherry, &c., should be set out without delay if a good germination is hoped for.

In some early localities plum trees could be pruned during May; but, unless the extent of area renders an early start necessary, there is nothing gained by autumn pruning.

The citrus trees could be sprayed yet with resin wash to destroy red scale. I have noted the effectiveness of this spray during May, and, although the fruits may be slightly stained, the scales are readily killed now.

The ever recurring codlin moth trouble has been much in evidence lately. The fruit-house question, no doubt, requires much more attention than it has received.

The utilisation of bandages upon the stems into winter, and the entry of the larvæ into the soil are points awaiting experimental work upon definite lines.

The scraping away of all loose or cracked dead bark, the clearing out of knot-holes, and the cutting away of broken ends of branches fractured by the weight of fruit, are means of combating this pest which should not be neglected.

MILDURA NOTES.

The Mildura Horticultural Society has opened its winter session with a lecture on "Manures and Manuring," by Dr. Howell, Ph.D., agricultural expert for the Victorian Government. Dr. Howell is a genuine enthusiast and a speaker of rare charm, investing his subject with all the glamour of a scientific fairy tale. At the same time, the principles of artificial manuring were driven home in the most practical and telling fashion. The composition of the soil, the chemical constituents of plants, and the results of many different experiments with varying quantities and kinds of manures were graphically illustrated by means of immense diagrams.

Dr. Howell and his co-adjutors appear to be aiming at a classification of the soils of the whole colony, and experimental plots are freely encouraged, nearly 300 having been put down last year. These, so far, have been mainly agricultural, but a number will be established in Mildura for horticultural purposes. Manures and all directions for their application are provided free by the Department. Experimental fields are divided into quantity plots, quality plots, and limed plots, as follows:—

Quantity Plots.

- No. 1. Complete manure, light dressing.
- No. 2. Complete manure, medium dressing.
- No. 3. No manure.
- No. 4. Complete manure, heavy dressing.

Quality Plots.

- No. 5. Without nitrogen (phosphoric acid and potash) medium dressing.
- No. 6. Without phosphoric acid.
- No. 7. Without potash.
- No. 8. No manure.

Limed Plots.

- No. 9. Limed, and manured like No. 2.
- No. 10. Limed, and manured like No. 5.

In Victorian soils the chief deficiency appears to be in phosphoric acid, and next to that in nitrogen. Green manuring with leguminous crops was strongly advocated by Dr. Howell as a means of supplying nitrogen.

Rules for the determination of the market value of manures were given, a work rendered very easy to every farmer by means of the manure lists made out every May at the Government laboratory, and the publishing of the unit values every year by the Agricultural Department.

Largely owing to the timely efforts of the Fruitgrowers' Association, which never neglects any opportunity of drawing public attention to the value of manuring and to the opportunity it offers of obtaining the same, the use of bonedust and superphosphate in Mildura has increased very greatly during the last two seasons, and it seems probable that before long the use of commercial fertilisers will become general in the settlement. The Association does an admirable work in disseminating literature of value to the tiller of the soil. Its latest introduction, "The Farmers' and Fruitgrowers' Guide" of New South Wales may be unreservedly commended to farmers throughout Australia.

Dr. Howell's visit to Mildura was followed by one from Mr. A. N. Pearson, Government Agricultural Chemist, who came on departmental business. Mr. Pearson did not lecture, but he inspected the settlement, and in an informal way met a number of the settlers one night for a general discussion on the question of soils and their treatment, and more especially on the question of our very-much-in-evidence saline areas. Mr. Pearson is well-known here through his booklet on "Manures and Manuring," which the Department distributes freely, and with which all members of our Horticultural Society were last year supplied, and also through an extensive analysis of samples of Mildura soils from the saline parts conducted by him some eighteen months ago.

At that time Mr. Pearson advocated a thorough testing of Mildura soils by an analyst to be stationed in the settlement, and the preparation of a map that should give a key to the value of the soils, more especially in reference to lands charged with excessive quantities of salt. He is still advocating the same idea, and we seem to be moving towards such a consummation.

The results of the analyses conducted by Mr. Pearson went to show that the common salt (sodium chloride) is the chief "foreign element" in our "seeped" lands, comparatively small traces of alkaline salts being discoverable. Gypsum therefore, which is used so much in California for converting the baneful sodium carbonate (known as black alkali) into the comparatively harmless sulphate, promises to be of no service to us except for its characteristic "opening" action on clay soils. Nor does Mr. Pearson hold out any hope of the possibility of neutralising the salt by any chemical means, though there are some in the settlement who are working towards such an end.

Experiments will be conducted by different settlers under Mr. Pearson's directions to show the effect of drainage by means of shafts sunk into porous strata, where this is practicable, and also to show the amount of salt extracted from the soil by crops of saltbush. In Mr. Pearson's opinion it should be made possible for holders of saline blocks to exchange them for good land, but the general deduction from experience here is that certain crops promise to pay well in the salt areas, though it will have to be seen whether the sultana, the olive, the pear, and the fig, which may be mentioned as typical salt-resistant trees, are going to stand the test of time. And of these the sultana is the only one that offers much return at present. The olive flourishes, but does not pay at present on any soils, despite enormous crops; local oilmakers, with a superb article, as yet finding no market for their produce. The fig does not pay, or at any rate the common white Genoa variety does not, and the pear seems too susceptible to the influence of wind. Lucern grows freely despite the salt, and possibly, with the advent of the railway, a trade may be opened up in baled hay.

NOTES ON VEGETABLE-GROWING FOR MAY.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

The continued cold dry weather of the last few weeks has been very unfavorable to the proper progress of vegetable crops. The cabbage and turnip crops are beginning to suffer from the ravages of the cabbage aphid. The cabbage moth is beginning also to make its presence known by leaving transparent spots in the leaves. If rain does not fall soon, efforts should be made to destroy these pests by spraying the plants thoroughly with tobacco and soap or kerosene emulsion. At the same time the plants should be stimulated to make good growth by the use of liquid manure or some quickly-acting chemical fertiliser, such as sulphate of ammonia or sodium nitrate. Daily hoseings with a swift spray will hold these pests in check somewhat.

The spaces between all growing crops should be constantly stirred, and some quickly-acting manure used where energy is wanting in the young plants.

Carrots, parsnips, beets, spinach, turnips, and similar crops require careful thinning before they cover the ground. The tops require room to expand as well as the roots.

Early peas require attention in the way of stakes. It is no use sowing peas now, as the cold of winter prevents perfect blooming.

Potatoes should be mounded up when a few inches above the ground.

The stalks of asparagus plants are dying, and should be cut away as soon as yellow. The beds could be top-dressed with stable manure, though there is no immediate hurry for this.

Celery should be earthed up as required. When doing this, care must be taken to avoid pieces of soil being folded in between the leaf stalks. A successional planting of celery should be made as soon as possible.

Cabbage, cauliflower, Brussels sprouts, &c., should be transplanted as the young plants reach a suitable size. In seed beds successional sowings of these should be made.

All the decayed haulms of tomato, melon, and other summer vegetables should be collected and rotted down. If any disease has been present reduce the stalks to ashes before adding them to the compost heap, and thus avoid one source of future infection.

All garden soil not in immediate use should be dug up roughly and allowed to weather. If the ground is stiff a good dusting of lime over the rough surface will benefit it. Lime should not be dug into the soil, but sown on the dug ground, and be allowed to penetrate by natural means.

The harvesting of marrows, trombones, &c., should take place before they have been exposed upon the wet cold ground for any length of time.

POULTRY NOTES.

BY D. F. LAURIE.

Some Victorian Stud Poultry Farms.

Recently I paid a visit to several leading stud poultry farms in Victoria, and saw much that was interesting, and the publication of my impressions should be of value to readers of the *Journal*. In the face of the regrettable neglect of the poultry industry in South Australia it behoves all interested to do their best to improve the situation and awaken public interest. Our Victorian brethren have for many years led the way, and from a knowledge of their doings, extending over seventeen years, I have come to the conclusion that they are more ready to take opportunities such as the egg and poultry export trades than we are, owing to the greater distribution of more profitable breeds of poultry among the actual

producers of the birds and eggs shipped out of the State. I may state that I only believe in the best of blood, and advise everyone to keep nothing else. I have kept most breeds, and have bred more hundreds of birds than most people have bred tens or single birds; I am well acquainted with the majority of successful breeders in the other States, and have their experience to go on; and my decision might reasonably be expected to carry due conviction on such a matter, which has in reality been a life study—not a hobby.

We must look at poultry in the same light as other farm stock. Animals or birds will thrive under certain conditions of environment, food, and attention; and if we neglect any important measures we may be sure of a corresponding result to the detriment of that stock. Most enlightened farmers admit the superiority of high-class stock, and few would take culls and weeds in preference. The average owner of an entire, bull, boar, &c., studies the requirements of the animal, and, to the best of his means, supplies them. The same cannot always be said of the poultry-owner. Nearly everyone keeps poultry, and the surplus birds and eggs form our market supplies. It stands to reason that the universal keeping of a better class of layers and table bird producers will put more money in the owners' pockets, as well as supply the consumer with more eggs and a better description of birds. Victorian breeders are very much up to date, and a visit gives a valuable insight into the general trend of public opinion on the subject.

There are two sides to the poultry question, viz., the utility and the fancy, both of which have to be catered for, as these are equal in money value at present. It is entirely owing to the so-called "fancier"—generally an astute and scientific breeder—that we owe modern breeds, with their increased laying, better table qualities, and early maturity. Many breeders still devote their attentions mainly to the purely fancy breeds, some of which are losing in popularity. The marked attention paid to the poultry industry of late years has created a great demand for the utility breeds; in consequence, stud poultry breeders have imported and are breeding the best birds possible. As a consequence, these are gradually being distributed, and a noticeable improvement is to be seen. It was to such poultry farms that I went, leaving the merely fancy ones for another occasion.

Mr. J. Maude, the premier Victorian authority, and probably the best poultry judge south of the line, devoted much of his valuable time in accompanying me, and selecting the yards best suited for my purpose. We first visited Mr. J. B. Jamieson, at Oakleigh. Mr. Jamieson has spent a large amount in up-to-date yards and poultry-houses, and keeps a number of breeds. The wire-netting used measures some miles. Victorians have no poultry tick; but they have numerous foxes, which get the birds, unless protected in high yards. The yards cover eight or ten acres of gently sloping land; a fruit tree is planted in each breeding pen, and several in each of the larger runs. The soil was a free sandy loam with deposits of fine yellow quartz, which is handy for supplying grit for the birds and gravel for the paths, &c. It will be seen that fruit-growing is combined with poultry-breeding, which is a point often urged by the writer. The runs are, as a rule, 25ft. x 30ft., and number twenty-five to thirty. The houses are of galvanized iron on roof and three sides, and open to the east. A novel feature is the adoption of the following method of collecting the droppings:—A sheet of hessian is stretched tight under the perches, so that all the manure is caught thereon, and a valuable return is found in the manure, which is removed every other day. The yards are covered with fine gravel, which is raked over every other day. Ample grass runs are conveniently arranged, so that the birds have a few hours thereon each day. The feeding troughs are arranged outside the yards, so that the birds cannot trample on the contents, and also as a matter of great convenience.

Sliding doors give access to the nest boxes, so that eggs are gathered from the outside. The water supply is conveniently arranged and well shaded; in fact, in all departments nothing is overlooked which tends to the welfare of the birds or the economical working of the concern. Mr. Jamieson aims at establishing a stud of very high-class birds, and, while producing the breeds in their perfection, does not overlook the very important utility points.

An imported trio of Silver-laced Wyandottes by the s.s. *Moravian* reached Melbourne a few days before my visit, Mr. J. Maude received a consignment of twenty-seven high-class birds, which his English agents had purchased for various Australian clients. Among them were these three Wyandottes, which are the best of the breed I have ever seen. The cockerel is a celebrated bird, as he won the English Wyandotte Club's cup and medal at the York Show, and was, besides, first at the Royal Lancashire, first Birkenhead, &c.; and the hens included the Palace winner, and another equally high-class bird. The type was first class, while the characteristic points of lacing, bars, comb, &c., were of the highest degree of excellence. I noticed a very perfect pullet of Mr. Jamieson's own breeding, and other high-class Wyandottes, many with excellent show records. Golden Wyandottes next came in view, and a better lot I have not seen; the average gold as seen here (in South Australia) is a very common looking bird, but these were "as handsome as paint," and like their fellows, the Silver-laced, presented evident signs that they were utility birds. I was told that as layers they rank very highly, and for crossing for production of high-class table birds you cannot beat the pure Wyandotte.

I also saw numerous splendid Brown Leghorns, Mr Jamieson having purchased the whole of Mr. J. Maude's breeding stock, which was the best pullet breeding strain in Australia. The birds are fine large specimens of splendid type and color, and with excellent head points &c. White Leghorns were also good, but I paid special attention to some handsome Buff Leghorns, the best I have seen. All these, in addition to ranking so highly as show specimens, are splendid layers. There were numerous high-class Minorcas, and Langshans, while lovers of the modern British Game would have delighted in the splendid samples of this favorite breed. The Pekin ducks, also ex s.s. *Moravian*, were a massive and grand team, and included the Palace drake and Challenge Cup duck, forming a great acquisition to the breed in Victoria. I paid a visit to Mr. G. E. Andrew, of Caulfield. I saw a great number of birds, some of the best being Silver Wyandottes, ex *Moravian*, which certainly were very good. There were a few Buff Orpingtons of good size, but the greater number of birds were not half grown, and therefore not seen at their best. I went out to Hallam's Road, and visited Mr. H. Bunneman, who has an extensive stud farm, and owns some excellent White Leghorns, Minorcas, Wyandottes (Silver), and some fair Brown Leghorns. These yards are on a slope, sandy soil, and eastern situation. The very extensive yards are planted and well shaded with magnificent silver wattles (*Acacia decurrens*). The hatching-house provides accommodation for fifty or sixty hens, each having a separate pen, dust bath, and covered run; a passage runs the full length. All buildings and poultry-houses here are of wood and iron, and fox-proof. There was an incubator room, and a room fitted up with training pens and appliances for preparation for showing. From there I went to Mr. A. Fahey's stud farm, where I saw considerably over a thousand birds, including Gold, Silver, and White Wyandottes, White and Brown Leghorns, and Minorcas. This farm is situated on a tableland, and, although somewhat wind-swept, the birds present a most healthy appearance; in fact, this was a marked feature in all the birds I saw, and they numbered over 3,000 at the various yards mentioned, and it must be remembered the moulting season was in full swing. I paid a visit also to Mr. Maude's well-known Montrose Poultry Farm, some four miles from Oakleigh, and spent a long time examining the wonderful birds there.

Mr. Maude has made Indian Games a specialty of recent years; when he came out with the big consignment of birds in the *Narrung* he had a spare cockerel which no one in South Australia would purchase—they did not know a good bird at sight, but the bird won at Essendon a few months afterwards, and was sold for three times the amount asked for him at Port Adelaide. By the *Moravian* Mr. Maude received the best Indian Game hen then in England, and on all hands admittedly the best seen in Australia. He refused £25 on the ship, and intends to breed from her. I saw several very high-class cockerels and cocks of the desired type, low set, and of splendid body, grand in color, and like lead when handled. The hens and pullers were marvels of color, lacing, shape, and quality. I doubt if there are any better to be seen. The value of the Indian Game in the production of high-class table poultry cannot be overestimated, and it is satisfactory to know that such good ones are in the States. I saw a grand team of Light Brahmas, ex *Moravian*. These are on their way to Charter Towers. They are the best I have seen, and caused much comment on arrival. They are very large and most beautifully marked, and altogether recall the days when the breed was one of the most popular. I saw some grand bantams—notably the black-rose combs—including a grand cockerel, a new importation. Some splendid Game Bantams, which have been sold in one line to a Sydney breeder, and a quintette of Scotch Greys Bantams for Dr. Lister, a marvellously pretty team, the first in Australia. These little hens of a few ounces weight lay great number of eggs, much liked by children and invalids. Minorcas were strongly represented, and among numerous very promising young birds I saw a forward one which will take no end of beating, if ever a bird is found good enough to do so. He was of splendid type, perfectly balanced, grand shape, splendid head points, the comb being remarkably good; in fact, almost too perfect a bird. I heard he was also bound for Charters Towers. There were some more cockerels as well as pullets that will run into high places at forthcoming shows. I was naturally anxious to see the parents of such stock, and found they were there, and that the cock was a winner and the hens A1. I have always had a desire to own a similar pen, and now I have the pleasure of feeding them, as they are said to be the best cockerel breeding pen in Australia. I hope they will do well in this State.

Mr. Maude is going to England in August to purchase a great number of high-class poultry for various Australian breeders. Some four years ago he brought out a lot for several South Australian breeders, and I hope others will do the same. Pens (a cock and three hens) cost from £10 and upwards landed here, and the risk is slight. There are plenty of new breeds, in addition to the old sorts, well worth importing; all are utility breeds and well known. I might suggest:—*Ducks*—Rouen, Aylesbury, Pekin, and real Indian Runner. *Geese*—Emden. *Fowls*—Laying breeds: White, Brown, Buff, Black, Pile, or Duck-wing Leghorn; Minorca, Red Caps, Campines. Table bird breeders and all round fowls: Buff, Black, and White Orpington; Gold, Silver, White, Black, or Partridge Wyandottes; Old English Game, Faverolls, &c.

I shall be happy to act in any way for any readers desiring information. Mr. Maude's address is Oakleigh, Victoria, and a letter will reach him the day after leaving Adelaide.

Naturally I visited the Government freezing works in Melbourne, and was delighted at the busy scene. A dozen men were hard at work plucking poultry, and several expert packers were also very busy; these operations are conducted with great celerity. Thousands of birds were being dealt with, and were to be seen alive in coops, cooling, being packed, or frozen in the chambers. Cases and cases of eggs were packed or in the cold chambers, the destination of the poultry and eggs being England and South Africa. A very large trade is done in eggs and poultry, and a leading London firm has a buyer in Melbourne, and

also in Sydney. This is a contrast of what I hear of our depôt; at any rate it seems useless for me to urge the value of the export trade if others write in answer to inquiries that, owing to lack of space on the steamers, there is no chance of exporting frozen eggs. There is some blundering. In Victoria and New South Wales facilities are offered, and everything possible is done to assist shippers and to foster the export poultry and eggs trade. If it is worth their while it must also be worth ours.

Further, the Victorian Agricultural Department has secured the services of Mr. W. T. Wright to deliver a course of twenty lectures in connection with the Working Men's College, Melbourne. The various branches of the industry will be dealt with, and big attendances are expected. We should do the same here. The School of Mines, Agricultural College, Chamber of Manufactures, poultry societies, and others should combine in the matter. Technical education in farming pursuits is not complete without accurate knowledge of poultry-breeding. The New Zealand Government have appointed four experts, and in England there are numerous county councils lecturers, including many well-known specialists. There is great need for the appointment of a lecturer here. I have refused hundreds of invitations, as I cannot be spared from the office, but with central lectures it would be a different matter. In any case the poultry industry deserves special attention, and I hope the editor of the *Journal of Agriculture* will bring before the powers the necessity of definite action next season—the exporting season is now over—the stuff must land not later than the end of June. Intending shippers should know when to send in their birds, and what sort to breed, and other particulars. The trade needs but a helping hand for a start, and then we shall be in line with Melbourne and Sydney, and producers would get a far better return for their money. Poultry is a far more important industry than a good many much-belauded ones, and the success of an export trade would mean widely-diffused prosperity.

MANURING OF WHEAT.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

The question of the quantity of fertiliser to apply per acre to the wheat crop is of the greatest importance to the farmer. From my knowledge of the quantities generally used in South Australia, I have little hesitation in saying that far more farmers apply less than 1cwt. per acre of phosphatic fertiliser than apply more than that quantity. For several years Professor Lowrie has insisted that these dressings of 60lbs. to 100lbs. per acre are insufficient for the requirements of the crop; but, notwithstanding that the results of his operations at the College farm year after year have afforded practical demonstrations of the accuracy of his statements, the majority of farmers are still unbelieving. The general statement is that if heavier dressings are applied the wheat plant will grow more vigorously, and in consequence will be very subject to being blighted by the first hot winds of summer. A frequent statement at the Bureau meetings throughout the country is that "In the opinion of the members 60lbs. to 75lbs. per acre is sufficient for this locality, owing to the deficient rainfall."

With the desire to bring the matter before farmers at the present opportune time, I propose to discuss the results obtained by Professor Lowrie at the Roseworthy College farm from a financial standpoint, in the hope that many will at least give the matter a fair test during the present season.

In 1897 the land at the College farm treated with 2cwts. of super. per acre yielded 22bush., the rainfall being 12·15in., of which only 2·25in. fell after end of August, the October record being 0·08in. It will be seen that the spring of

1897 was exceptionally dry, yet the heavily-manured wheat yielded 22bush. of wheat per acre, while the average for the Central District was only 3·38bush., and for the Lower North 3·10bush.

In 1898 the rainfall recorded at the College was 17·7in. The spring fall was:—September, 0·56in.; October, 1·50in.; November, 0·47in.; the yields obtained from land manured with 2cwts. super. per acre varying from 21bush. to 22½bush., the average for Central and Lower North being 6·59bush. and 5·36bush. per acre respectively.

In 1899 the rainfall was 14·89in., and the returns from test plots were:—Land treated with 1cwt. super., 14 bush. 48lbs.; and from 2cwts. super., 18bush. 53lbs. per acre. The spring rainfall was:—September, 1·74in.; October, 0·68in.; November, 1·55in.; the average for Central and Lower North districts being 5·33bush. and 4·7bush. per acre respectively.

In 1900 the returns were:—From 1cwt. super. 23bush. 40lbs.; and from 2cwts. per acre, 30bush. 16lbs. The rainfall was about 19in.; but, as will be remembered, the early spring was hot and dry, and many complaints of the blighting effects of the hot winds were made.

Anyone looking at these records must admit that at the Roseworthy farm at least the application of 2cwts. per acre of super. has not in any way injured the crop, notwithstanding the dry weather so frequently experienced in the early spring months; on the contrary, in each case the application of 2cwts. per acre has been decidedly more profitable than the use of 1cwt. This being so at Roseworthy, why should not equally favorable results be obtained elsewhere on similar soils in districts where the rainfall is equal to or greater than at Roseworthy?

Let us look at the financial side of the 1899 and 1900 returns, the two years when a comparison is possible between land treated with 1cwt. super. and 2cwts. super. per acre respectively.

Year.	Yield from Check Plot.	Plot Manured with 1cwt. Super.	Plot Manured with 2cwt. Super.	Net Profit per Acre from Use of 1cwt.	Net Profit from 2cwt.
1899	6bush. 21lbs.	14bush. 48lbs.	18bush. 53lbs.	£ s. d. 0 16 9	£ s. d. 1 2 10
1900	20bush. 26lbs.	23bush. 40lbs.	30bush. 16lbs.	0 3 8½	0 15 10

In estimating cost and return the wheat is valued at 2s. 6d. per bush., and the Adelaide cost of manure is put at £4 7s. 6d. per ton. It will be seen that the return from the unmanured plot in 1900 was exceedingly high, due to the fact that the land is in good heart from effects of previous treatment. In 1899 the second 1cwt. (costing, say, 4s. 4½d.) gave an extra profit of 6s. 10d., after paying for the manure. Last year the extra net profit from the heavier dressing was much greater, viz., 12s. 1½d.

We can look at these figures from another standpoint. Taking first the 1899 figures, the return from use of 1cwt. per acre of super. is 14bush. 48lbs. Assuming that a farmer has 400 acres in crop, the gross yield would be 5,920bush. If he had used 2cwts. of super., and obtained 18bush. 43lbs. per acre, 316 acres under crop would have yielded the same quantity of wheat. The 1900 returns will work out almost exactly the same way—400 acres at 23bush. 40lbs. represents 9,467bush., while at 30bush. 16lbs. per acre it would take under 313 acres to produce the same total. If the yield is taken from 400 acres in each case, it would show an extra return, with wheat at 2s. 6d. per bushel, in 1899 of £204 3s. 4d., and in 1900 of £330. The individual farmer is the best judge what the profit, looked at in another way, represents, viz., the difference in cost of cultivating, sowing, harvesting, &c., of 400 acres

and 316 acres respectively, plus the extra value for grazing for sheep of the eighty-four acres that would not need to be put under cultivation.

This question of the most profitable amount of manure to apply per acre is one that can be easily settled by the farmer testing it in a practical manner, instead of allowing the fear of "blight" to stand in his way. Anyone looking up the discussions throughout the colony of five or six years ago will see that for a long time the same fear had operated to delay the general adoption of the seed and fertiliser drill, yet to-day five out of six farmers are ardent advocates of it. The cost of putting in four or five test plots of five acres each would not be great, while the experience gained would be of immense value. These plots should be manured at rate of $\frac{1}{2}$ cwt., 1cwt., $1\frac{1}{2}$ cwts., and 2cwts. per acre respectively, but otherwise treated alike, and harvested separately. The harvesting will probably present the greatest difficulty, as extra time is required just at the busiest season, but this could be readily overcome with a little management.

ARSENIC IN SUPERPHOSPHATE—AN UNWARRANTED SCARE.

Owing to the deaths from beer-poisoning recently reported from England having been traced to the use, in the refining of sugar, of sulphuric acid containing arsenic, attempts have been made to raise a scare in respect to the use of superphosphates. Sulphuric acid is one of the main factors in the production of super., and it has been asserted by some that there is considerable danger of injury both to the crops and to animals from the arsenic which the sulphuric acid contains. This aspect of the question was debated at a recent meeting of the Society of Chemical Industry, of London, when some emphatic and significant statements were made. Several authorities stated that, comparatively speaking, few things were absolutely free from arsenic. Various plants naturally contained arsenic, and certain articles used in every household as food also showed its presence on analysis, but in such exceedingly minute quantities that, as—referring to the presence of arsenic in tartar emetic—one speaker put it, if tartar emetic was taken in a sufficiently large dose to contain a dangerous quantity of arsenic, the tartar emetic would do its work much quicker than the arsenic.

Dr. Voelcker said, as regards arsenic in superphosphate, there was absolutely no proof that the arsenic was ever taken up by plants grown in arsenical manures.

Mr. B. E. R. Newland read a letter from Sir Henry Gilbert, of Rothamsted, in which it was stated that experiments had been made on two crops—one manured with arsenates and one with phosphates. The results of the tests were absolutely negative as regards the injurious effects of arsenic.

Dr. Bernard Dyer said at Rothamsted there are fields which for sixty years have been heavily manured with chemical fertilisers every year, and there was no other spot in England where finer crops could be seen. This was the most practical comment he could make on the effect of minute quantities of arsenic on crops.

Only one speaker expressed a different view, and his opinion was based on deductions which were shown by others to be wrong.

Various newspapers have discussed the subject. The *Lancet* says that superphosphate is *rich* in easily-soluble arsenic, which has been proved to be *readily taken up by plants*, and suggests that as the arsenic *accumulates* in the soil its presence in malt may arise from this cause. This is, however, directly contradicted by most authorities. Most people know that arsenic forms the base of most scrub exterminators, but there is no proof that any plant will absorb any

considerable quantity of arsenic. If super. were "rich in easily-soluble arsenic," as stated by the *Lancet*, the wonder is that all the wheat put in the soil in actual contact with super. is not destroyed as it germinates. Dr. F. W. Koeller, of Kandy, writing to the *Tropical Agriculturist*, of Ceylon, in regard to this matter says, in a sarcastic manner, "I beg to inform you that cabbages and turnips manured with superphosphates are surely poisonous, and I estimate the quantity of cabbages or turnips which should poison a man to be at least 1 ton daily."

If there were any real grounds for the alarmist statements now being copied by various newspapers, the wonder is that any of us are alive to-day to discuss the matter.

EXPORT BUTTER TRADE.

BY G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

The past season's export butter shipments has fallen short of the preceding year, which is partly attributed to an early drying off of a promising feed and partly by the high prices paid for produce throughout the markets of the State. With a deficit, however, we exceeded the past two seasons in point of excellence; still a large trade in low-grade butter was unfortunately continued.

If South Australia as an export State determines to realise prices comparable to the Danish product the general quality of our shipments must unquestionably rise. Denmark owes her success to the uniformity and choice quality of butter exported to the London market in well-regulated supplies. These invaluable attainments have been achieved by the rapid advance of scientific education, and by an application of close and careful study to the demands of the British buyer and consumer. There is not a country in the world where practice combined with science in the industry of dairying is more dominant than in Denmark, and where development towards perfection in butter manufacture has been more clearly demonstrated. In the early shipments of butter from Denmark the State realised the seriousness of existing defects, and, with a determination to conquer the causes, the Dane now finds himself without a near rival. The progress of Denmark is an object lesson to every dairying country, and what has been accomplished to advance the industry has been done openly and without a shadow of concealment. We grudge the prominence of our rival, and many people still attribute the entire success of Denmark to her close proximity to the home markets, but we have suffered in consequence of our neglect to recognise the key to the coveted position.

Aided by the system of pasteurisation, the Dane has placed the industry on a firm basis, and to-day few factories are without the requisite plant. The introduction of pasteurisation favors a keeping product, which is a most valuable acquisition to countries exporting to a distance, but it is open to question if the aroma in the pasteurised article has that attractiveness which is so characteristic in butter manufactured from cream ripened in the ordinary manner. The existence of a contaminated milk supply retards the good influence of the practice; hence it is absolutely necessary to devote attention to care and cleanliness. The weakness in Australasian dairying is rooted in defective milk and cream supplies, and delay in taking active and progressive steps to lessen the predominating evils will further encourage and mark the advance of foreign rivals. It cannot be denied that South Australia is a scattered dairying country, with conditions that are not altogether favorable to every branch of dairying; but it is firmly assumed by those who are thoroughly conversant with the capabilities of our soils and natural food for milking stock, and the characteristics of the climate, that the State is productive of quality in both butter and cheese second to none in Australia. A great obstacle to the production of uniformity in our butter is found in the long transit of milk and

cream by road and rail to country and town factories. Exposure of cans in summer weather to the deteriorating effects of heat soon brings disaster to the raw products of the dairy. But much could be done to prevent the heavy summer losses by more attention to the keeping and cooling of milk and cream before and during transmission to the factory. By a strong endeavor on the part of suppliers the losses can be reduced considerably by the introduction of a simple means already advocated in a previous number of this *Journal*. Ably assisted by a system of inspection, combined with instruction, not alone would the standard of our factory export butter rise, but the general quality of the dairy product would also improve. There is much scope for tuition in this line of export, and it would be welcomed by the buttermakers of the State, who rely solely on the work of the instructor in the dairy and at the churn; and further help would be gained by closer attention to railway defects. Unfortunately, damage to produce on the railways has been evident throughout the past season, and the industry may well reflect on the heavy losses sustained.

Butter-grading.

The shortcomings in our export butter trade have been carefully and systematically noted in books specially prepared for the purpose. Entries were made of the condition of the boxes on their arrival at the Government Dépôt, and the defects in flavor, texture, color, salting, packing, and branding of the butter were recorded. To every factory or buttermaker exporting a special report was issued giving the scale of points awarded, grade, condition of boxes, and instructions for future improvement. The value of the above system is at once apparent. It would be absurd, however, to claim that an authentic guide is given to the quality of the produce on its arrival in the London market. Still, the maximum points awarded compare very closely to the prices realised for the butter in England. This I found to be borne out when reviewing notes with a produce buyer who had returned from the old country.

With a view to extending the value of grading to a more profitable issue I have, through the Hon. the Minister of Agriculture, communicated with the dépôt authorities in England asking for reports on the quality of our butter as it arrives in London. Were this agreed to, I should be in a position to draw a comparison of the results of grading at Adelaide and the examination at London, and from this much good would accrue to the interests of butter-makers and to the whole industry.

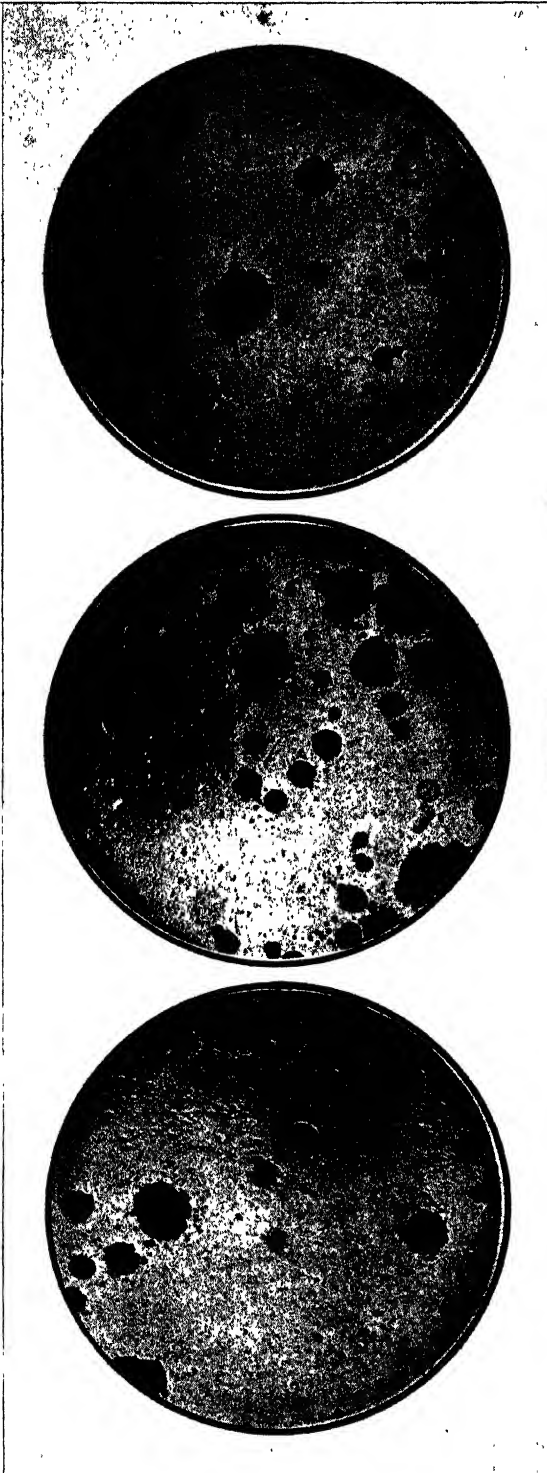
The number of reports sent out to the factories this season giving a complete account of their consignments was 418, and it is very encouraging when one observes that attention has been given to the instructions appended. By the system of grading considerable loss was prevented to both the factories and the State, and further improvement is expected to follow. For the benefit of the industry I have succeeded in furnishing a complete record of the percentages of defects in factory-made butter exported last season. These have been obtained from the grading-books, and will be of value as a guide to instruction in the dairying districts of the State where the highest percentages have occurred in the months named. In the percentages given I may state that faint traces of weakness in the quality of the butter are included; therefore one must not think that the defects were pronounced in every case.

I will begin by treating the most important feature first, viz., flavor. The percentages for the shipping months will be given throughout.

Fishy Flavor.

August	Nil	October	1.6
September	0.48	November	4.4

The above percentages of butter came from the best districts in the State, and in not one instance was a box manufactured in a dry part of the country where



No. 1.—Showing colonies of the *Bacillus fuscus*, *micrococcus aureus*, *Aspergillus* mould, and *Bacillus acidi lactici*.

No. 2.— *Bacillus fuscus* and *Bacillus acidi lactici*.

No. 3.— *Bacillus fuscus* *Micrococcus flavus* and *Bacillus acidi lactici*.

feed was short, The extent of fishiness is shown to increase in the months quoted, but this can be accounted for by larger shipments from the nine factories which were affected.

In the recent Government butter test it was particularly noticeable that the best brands suffered most after refrigeration, and it is not improbable that a quantity of the past year's export fishy butter was kept for some time at the factories under cool temperatures. On the subject of fishy butter I have written notes (*Journal of Agriculture*, May, 1890; March, 1901; and May, 1901), and have conducted extensive experimental work. A series of refrigeration tests will be undertaken, when it is to be hoped we will have a clue to the mystery.

In the past numerous bacteriological plate cultures were prepared from fishy samples of butter, but no organisms have up to the present been isolated which have reproduced the fishy flavor. A great deal of experimental work is still open to the investigator. Tests have not yet been made of butter washed free from proteid matter and with and without salt. It is well known that unsalted butter is not usually attacked with fishiness. Why this should be has not been explained.

Plate Cultures of Fishy Butter.

The following plates were prepared from two export boxes of very fishy-flavored butter. The boxes had been kept under refrigeration for three months.

After the plates were photographed by Mr. Ernest Gall, who has done all the photographic work to date, they were sent to Dr. McDonald, bacteriologist, Adelaide Hospital, for microscopic examination. In his report the names of five different organisms are given, three of which belong to the organisms of water, and the remaining two are *aspergillus* mould and *bacillus acidilactici* (cream-ripening organism). Colonies of the latter were few in numbers.

In the percentage of affected butter given it is shown that the presence of fishiness prior to refrigeration is very limited when we consider the extent of the flavor in boxes of butter after their arrival in the home markets. That fishiness is common in our export butter after refrigeration must be accepted after what was demonstrated in the Government test of 1899. The value of the proposed reports from London would, in the instance of fishy butter alone, amply repay for the nominal cost of examination. With tests made in Adelaide, and again in London, fishiness and other taints and defects would be investigated both scientifically and practically, and experimental works could be undertaken in branches of butter-making and their values proven.

Cowry and Weedy Flavors.

August	28 per cent.	October	7.8 per cent.
September	18 "	November	2.6 "

In August and September these objectionable flavors were very common, and are characteristic of the custom of using the milk from freshly-calved cows and at a season of the year when taint-producing weeds unfortunately predominate. To my knowledge it is apparent that "new" milk absorbs the flavors of plants in a more retentive form than milk from cows advanced in lactation. To illustrate this contention the following extracts are given from the percentages under consideration:—

Out of 416 boxes of cowry or weedy butter shipped in August, 312 boxes had both flavors.

Out of 463 boxes of cowry or weedy butter shipped in September, 34 boxes had both flavors.

Out of 248 boxes of cowry or weedy butter shipped in October, 124 boxes had both flavors.

In the month of August no butter was shipped having the weedy flavor alone.

In September only ten boxes were weedy, and in October twenty-two were weedy. From what has been said on this subject, much is the necessity for

dairymen to abstain from keeping colostrum for local butter-making, and during the early months of the next export season suppliers must cease sending it to the factory and wait until the condition of the milk has become normal, when the desired aroma is present. It is unfair to the buttermakers, and is a discredit and a loss to the factories and to the industry. Last year the efforts of the Dairy Board were beneficially felt through the distribution of printed notices amongst the factories, and drawing attention of suppliers to the necessity of taking active steps to stop the practice. Readers might re-turn to the *Journal of Agriculture* for October, 1900, and carefully consider the account given on colostrum, also the articles on "Aeration of Milk" and "Milk-testing" published in the February number of this year's *Journal*.

It would be interesting to know if cowy and weedy flavors are reduced in intensity after refrigeration, or if they give rise to the development of taints of a more serious kind. Again, we have another striking example of the value of examinations at London, which would meet with some of the requirements connecting original research.

Acidy and Sour.

August.....	Nil	October.....	5.3 per cent.
September	6.1 per cent.	November.....	1.4 "

The high percentages in September can be accounted for by keeping cream at low temperature, which necessitates slow fermentation. The sluggish development of acid which naturally follows causes a sickliness in the body of the cream, and injures the quality of the butter manufactured.

Bitterness.

August.....	Nil	October.....	1.4 per cent.
September	0.6 per cent.	November.....	0.5 "

Bitterness can be attributed to weeds, and also to a bacteriological change which sets in when cream is ripened in cold rooms, as underground cellars. I have observed that acid, sour, and bitter butter have come principally from a few factories, and this information will enable me to devote attention to these defects before the opening of the next export season.

Cheesiness.

August.....	Nil	October	0.5 per cent.
September	"	November	3.4 "

Injury to flavor and texture is shown to extend as the season advances, but it was apparent that the butter affected with a cheesy flavor came from late dairying districts where plant growth was vigorous.

Tallowy Butter.

August.....	Nil	October	1.5
September	1.5	November	Nil

Tallowiness was little evidenced, and what was affected was found in butter that had been churned from old cream and afterwards kept some time before shipment.

Texture of Butter.

	Greasy.	Streaky.
August	10 per cent.	2 per cent.
September	11 "	8 "
October	5 "	6 "
November	5 "	3 "

Greasiness in August and September can be accounted for by the softness of the butter fats and by permitting the butter to become too hard before the second working, when damage to texture invariably follows.

Streaky butter follows the use of inferior salt and insufficient working of the salt into the body of the butter. September month claims the highest percentage in both faults.

Finish of Boxes.

The following were roughly finished on the surface and were otherwise neglected :—

August	7 per cent.	October	0·7 per cent.
September	8 “	November	0·4 “

Export buttermakers might attend to this in future, and finish off the butter neatly, and with a decoration of some kind on the surface ; also, I would draw the attention of managers to the necessity of using only the best packing-paper, as an inferior quality was noticeable in a few factory shipments last season.

Dirty and Damaged Boxes.

One hundred and nine boxes were received at the dépôt in a dirty and damaged condition, and the quality of butter in other instances suffered through exposure to heat while on transit to the dépôt.

Brands.

The practice of branding boxes for export purposes with paint of a non-adherent quality, and subject to the influence of moisture, must be discontinued in future. Throughout the past season many consignments of butter arrived at the dépôt with the brands obliterated and showing the paint in ugly patches over the surface of the boxes. By the exposure of those boxes to the moisture of the refrigerated chambers, and the necessary handling before and after refrigeration, it was no surprise to find their condition very unsightly. It is to be hoped that shippers will take heed and have this last grievance rectified in years to come.

Percentages of Defects for Export Year of Factory Butter and for Best and Worst Months.

Season.	Best Month. Percentage per Month.	Worst Month. Percentage per Month.
Fishy, 1·6	August, nil	November, 4·4
Cowry and weedy, 11·2	November, 2·6	August, 28
Acid and sour, 4·2	August, nil	September, 6·1
Tallowy, 0·75	August and November, nil	Sept. and October, 1·6
Cheesiness, 0·9	August and September, nil	November, 3·4
Bitterness, 0·6	August, none	October, 1·4
<i>Texture.</i>		
Greasiness, 7·5	October and November, 5	September, 11
Streakiness, 4·7	August, 2	September, 8

DAIRY PRODUCE AT AGRICULTURAL SHOWS.

By G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

The exhibitions of dairy produce at the past agricultural shows held in Adelaide and Mount Barker were very creditable to the manufacturers. The general quality of the butter at Adelaide was approaching perfection, and the standard of the majority of cheese exhibits at Mount Barker would be difficult to surpass.

In the award of points in the export section at the Royal Show of a point extra would have been gained by each exhibitor had the surface of the butter been finished off with an attractive decoration ; but, according to the rules of the society, a smooth surface was essential. Assuming that an ornamentation had been put on the butter, the fourteen exhibits would have scored as follows, out of a maximum of 100 points :—99·5, 99·25, 99, 98·75, 98, 98, 98, 97·5, 97·5, 97·5, 97·5, 96·5, and 96·5.

When factories are showing in future I would strongly recommend managers to conduct a few experiments in the manufacture of their products; encouragement would be given if agricultural societies made a special class for experimental exhibits. By such an enterprise the value of pure cultures could be tested, also pasteurisation and many other modern practices demonstrated; and now that judging by points is becoming general, the manufacturers would be in a position to follow the differences in the awards, and thereby ascertain in which direction their products had gained by the process of manufacture. In cheese-making a greater latitude would be open to the investigator, and when judges of cheese adopt points in arriving at their decision the perfection of the system will prevent the disappointment to exhibitors by making clear the existence and extent of the defects, and will promote a desire for keener competition, and still further increase public attention.

In the carefully judged cheeses at the above-named shows I observed that the prizes most deservedly went to the products possessing the finest flavor, but it could not be overlooked that the texture of cheese not placed in the honors list was superior to the higher classed exhibits. Deciding the prizes by points would, in such an instance as the above, clearly show the educational value of a system which tends not only to improve the flavor, texture, and color of cheese, but aims at reform in the general finish of the exhibit. In adopting the suggestion, the following scale might be taken as favorable:—Flavor, 60 points; texture, 30; color, 5; finish, 5.—Total, 100.

From the show tables instructive lessons could be learned, notwithstanding the good quality of the produce. Exporters would do well to mark what Mr. Crowe said with reference to the defective paper used for packing the butter and the slight weakness in salting noticeable in one or two of the exhibits. I would also like to draw the attention of factories to the necessity of regulating the fermentation of cream, there being an evident weakness in the Mount Barker Show butter, which Mr. Crowe attributed to lack of care in ripening, or rather to the want of control over the temperature during the development of acidity, and which, in hot weather, can only be done effectively by the aid of refrigerating machinery. To be guided in this very important branch of butter-making, let the acidity apparatus be used, and, if carefully manipulated, with a supply of cream free from acid preservatives, the operator cannot make an error, and the profits to the factory will be well worthy of the outlay.

Plate Cultures of Butter Organisms.

To show the bacteriological condition of the prize butter, I arranged with Mr. Crowe to take samples in tubes sterilised for the purpose. This was done, and plates were prepared in the usual manner from one drop of butter.

Prize Butter.

No. 1 shows numerous colonies of the lactic or cream-ripening organisms, and is free from injurious germs.

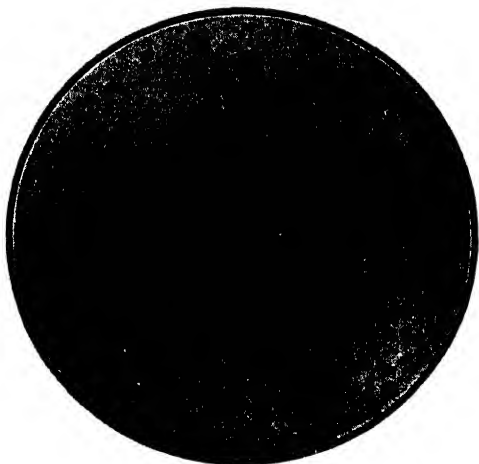
No. 2. The colonies are also of the lactic species, but *oidium lactis* mould was noticeable on the plate.

No. 3 shows a few colonies of *oidium lactis* mould amongst the lactic acid groups.

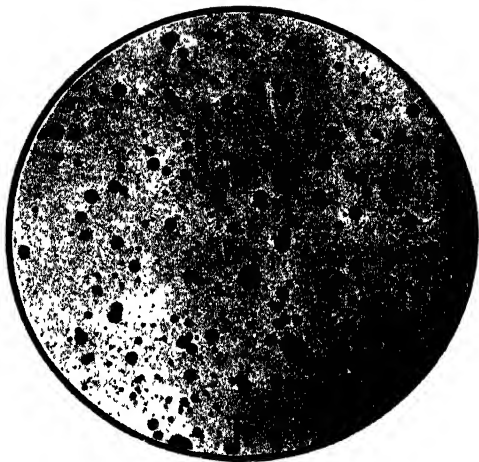
Market Butter.

No. 4 was taken from ordinary sale butter showing a very milky brine, and clearly proves the necessity for good washing. At the time of testing, the butter was a first-class sample, but soon lost in flavor and became poor in quality.

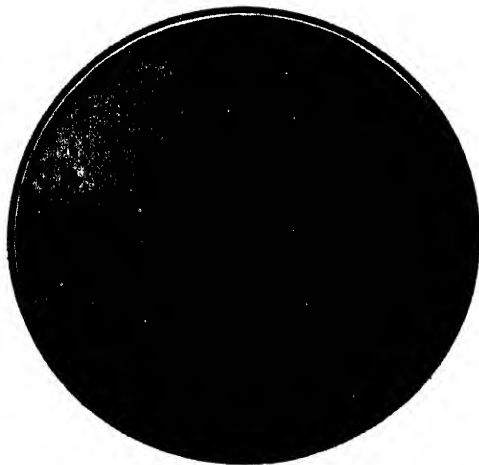
No. 5 was cultivated from a quantity of butter that had been washed with impure water.



No. 1.—Colonies representing the *Bacillus acidilactici*.



No. 2.—*Bacillus acidilactici* and trace of *Oidium lactis* mould.

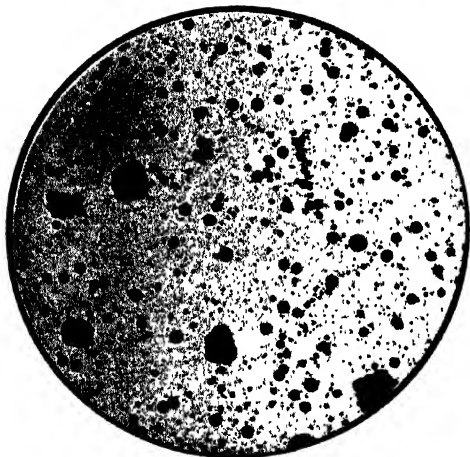


No. 3.—*Bacillus acidilactici* and *Oidium lactis* mould.

No. 4.—*Bacillus acidilactici*.



No. 5.—*Bacillus acidilactici* and numerous colonies of water organisms.



No. 6.—*Bacillus acidilactici*, *Ordium lactis* mould, and many colonies of injurious organisms.



No. 6 is a cultivation from inferior butter. A number of moulds are clearly illustrated.

In an article on "Contamination of Dairy Produce and its Causes," printed in the *Journal of Agriculture* for October, 1900, twenty-seven plate cultures and illustrations are given, showing how contamination of butter follows the use of impure water for butter-washing, exposure of milk and cream in dirty milk rooms, and dirty and careless milking. Readers might return to that number, which also gives an account of the preparation of the plates.

In the Government butter test of 1899—*Journal of Agriculture*, January, 1900—the chemical and bacteriological analyses of the water supplies of the eighteen factories competing gave evidence of the extent of the impurities, and it is to be hoped that directors and dairymen will give this matter serious attention.

HARD BUTTER—A GOOD FEATURE.

BY G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

At the present season of the year hardness of butter is being complained of, and a few dairy farmers have written asking the cause and treatment against a recurrence of the trouble. Hardness is not a bad feature in butter even in the cold weather, and it is a profitable one to consumers if they take the trouble to soften the product for table use. A few months ago the cry was heard from all quarters complaining of the oily consistency of butter, and the work and expense that was incurred before sufficient solidity could be obtained to have the butter in a marketable condition. A little less trouble and expense will be required to manufacture an article with a soft texture.

Hardness will result from the very low percentage of water contained in the butter. In the analyses of six samples, four of which were hard and two soft, I found the following percentages of water:—Hard butter, 6.153, 7.321, 7.834, 7.981; soft butter, 10.761 and 10.832. The densities and melting points of the samples were taken; also the opacity, which showed that the hard butters had a high percentage of solid fats. Other samples have been examined with similar results.

In certain districts in the State it is found, by experience, to churn cream at high temperatures, and a firm butter is manufactured throughout the year, while in other parts the churning temperature is much lower and the texture of the butter is softer. The solidity of butter is influenced by climate, rainfall, quality of soil, and the maturity and nature of herbage. The latter is beyond question, and has been proven in extensive feeding experiments which are going on at present. Breed of cows, period of lactation and method of cream-ripening, churning, salting, and working, all tend to raise or lower the melting point of butter.

The following is a summary of the principal causes:—

- (a) Quality of food and manner of feeding.
- (b) Separating cold milk.
- (c) Cream-ripening in small quantities in cold rooms.
- (d) Churning at a low temperature.
- (e) Churning into lumps.
- (f) Temperature of washing water too low.
- (g) Overwashing.
- (h) Use of inferior salt.
- (i) Excess of salt.
- (j) Overworking.

Suggestions for Future Treatment.

1. Every night the cows' food should be prepared in a trough. Pour over the mixture a quantity of hot water sufficient to moisten the food, cover with bags, and feed each morning and afternoon. Give green food.

2. Have drinking water near the animals.

3. Separate the milk morning and evening. If the quantities are too small to necessitate separation twice daily heat up the cold milk to over 100° F., and separate by itself. Run warm water through the separator before working.

4. When churning twice a week ripen in one can and keep in warm place. A quantity of buttermilk from a good churning might be added to the cream to encourage ripening and this continued as long as the quality of the butter remains high. Do not add fresh cream to bulk later than twelve hours before churning.

5. Churn cream at 62° F., but this will depend on district and other conditions. If cream is too low in temperature add warm water to bring it up to the most suitable temperature, as found by experience.

6. Pour quantity of warm water into the churn ten minutes before churning and rinse out immediately before cream is added.

7. Churn into grains.

8. Wash once in water, having the cold chill taken off.

9. Add a quantity of brine as a second washing.

10. Work a few seconds and add best quality of salt, and not more than 2 per cent.

11. Work carefully and thoroughly.

12. Do not work a second time. But if this can be done do so not more than two hours after the first working.

13. Do not keep the butter in the coldest place in the house.

DISC-HARROWING OF LUCERN.

Most American farmers attach the Spanish name "alfalfa" to lucern. Mr. H. M. Cottrell is manager of the Experiment Station, Manhattan, Kansas, and reports as follows:—

"Our first experience in discing alfalfa was in 1898. A field had been seeded to alfalfa in the dry year of 1894, and a poor stand secured. In 1897 this alfalfa was heavily pastured by hogs. The hogs were taken off early in the fall, and a heavy growth of crab grass came up. The crab grass was so thick and the stand of alfalfa so thin that it was not worth keeping. Late in March, 1898, this field was harrowed with a disc harrow, the discs sharp and set at as great an angle as possible. It was immediately cross disced with the discs set the same way. The ground was thoroughly pulverised, and the alfalfa apparently destroyed. It soon started, branched out thickly, and we made three good cuttings from that field that summer.

"In 1900 we went a step further in discing alfalfa. The season was very dry at Manhattan, the rainfall in June being 1.19in., in July 4.51in., and in August 2.84in. Two fields of alfalfa two years old were disced. One field was disced March 28, the first cutting for hay made May 31; disced June 6, the second cutting for hay made June 25; disced June 27, the third cutting of alfalfa made August 13, and the alfalfa disced for the fourth time August 20. The last cutting of alfalfa was made September 13. This shows four discings and four cuttings of alfalfa on upland in a dry year. Another field of alfalfa was disced and cross disced March 27. The first cutting of alfalfa was made June 4, and the second discing June 6. Through July and the early part of August the alfalfa was cut from day to day and fed green to dairy cows to help out

dried-up pastures. August 20 the field was disced, and October 3 the last cutting of alfalfa made. The alfalfa in both fields made fine late fall growth and went into the winter in good condition.

"The stand of alfalfa on both fields disced in 1900 was good. A harrow with sharp 16in. discs was used, the discs being set at a slight angle, just sufficient to turn the soil over, and the harrow was weighted to make the discs split the alfalfa crowns to a depth of 2in. The discing split the alfalfa roots, and this made them throw out many new shoots. The discing made an earth mulch over the field and prevented the evaporation of water, so rapid in a dry time from an alfalfa field just after being cut. The discs were set so that they barely turned the soil over, and, running at a depth of 2in., they turned the roots of the crab grass and weeds up to the sun, which killed them. These disced fields were clean and free from crab grass in the fall.

"We have not disced one-year-old alfalfa. From these experiments we feel safe in recommending discing all alfalfa of two years or more standing. Make the first discing early in the spring and then disc immediately after each cutting. If the stand of alfalfa is fair to good, set the discs as we did in the experiments made in 1900. If the stand is poor and the growth of crab grass thick, set the discs to cut deeply. Discing is of as much value to alfalfa as cultivation is to corn."

THE VALUE OF TUBERCULIN AS A TEST FOR TUBERCULOSIS.

BY C. J. VALENTINE, CHIEF INSPECTOR OF STOCK.

The use of tuberculin as the best means of proving whether an animal is affected with tuberculosis, after being generally accepted by the leading scientists in Europe, and after much care and practical inquiry by the leading veterinarians in Great Britain, has lately been strongly objected to by breeders and others. The *Breeders' Gazette*, Chicago, writes:—

"The officials of the Agricultural Departments of the United States and Canada are confronted with a grave situation, the result of the misleading advice of over-zealous scientists. Breeders now demand of them the abolition of the compulsory test. Its fallibility has been demonstrated; its ineffectiveness has been proved; its danger is undoubted."

The *Live Stock Journal* makes the following remarks:—

"The scepticism as to its infallibility has been confirmed by experiment, and other defects are being gradually discovered by those who have adopted it. That it possesses a certain amount of diagnostic value has never been denied, but (as the Dublin experiments prove) it, in a percentage of cases, condemns the innocent and acquits the guilty. It further gives no indication of the extent or seriousness of the disease, and is less reliable in bad cases than in those of cattle only slightly affected; it opens up the door to fraud on the part of the unscrupulous, inasmuch as it is apparently possible to saturate the systems of animals with tuberculin until they cease to react."

The cause of the opposition to its use evidently arises from what may be termed its misuse in the export and import of cattle, the circumstances connected with such operations leading up to an abuse of the test, and thus discounting its value as a diagnostic agent in milking herds. Like all innovations on the usual routine of work, serious objections are continually raised. Every new action must be proved absolutely, or it is not of any practical value. It does too much or too little, or it must be injurious and a menace to health. Practical men disagree with scientists, who are said to desire action which, although there may be some truth in it in practice, cannot be relied upon and

is open to imaginary dangers; yet we know it is by the careful and thorough research of the scientist that true facts are arrived at. That mistakes are made in the use of tuberculin as a diagnostic agent may be readily admitted, but the careful practical use which has been and is being made of it in many cases go far to prove it is one of the best means available for the elimination or reduction of tuberculosis in the bovine family. After careful investigation in Great Britain, Professor McFadyean has issued directions for its use, and it is by the careful and systematic use and manner in which the test is conducted that its success or otherwise is proved.

In Europe it has been made practical use of for some years. In Denmark, where the butter industry is the most important occupation, and wherein the wealth of the people lies, a scheme under the direction of Professor Bang, a practical scientist, has been carried out, based on the facts that contagion plays the principal part in the spread of bovine tuberculosis, that the calves of tuberculous cows are almost invariably born healthy, and that tuberculin is a most reliable agent for the detection of the disease. To begin with, the whole herd is tested with tuberculin, and thus divided into a healthy and tuberculous section. The two sections are then separated, and have separate attendants. The healthy section is tested every six months with tuberculin, and any animals which react are at once removed to the tuberculous section.

Those animals of the tuberculous section which are obviously affected are got rid of, but those which are apparently healthy are kept and used for breeding purposes as long as may be convenient; and as they will generally be fattened for slaughter before the disease is far advanced, the total condemnation of their carcasses as butcher-meat will not, as a rule, be necessary. The calves of the tuberculous section are removed to the healthy section immediately after birth, and are fed for the first day on colostrum which has been heated to 65° C., and subsequently on boiled milk.

At first these calves were kept in separate boxes, and only added to the sound section when they had successfully undergone the tuberculin test, but Professor Bang thinks now that they may with safety be removed to the sound section immediately after birth, and wait till the time of the general half-yearly testing to undergo the trial with tuberculin. The following is a brief account of the results obtained by Professor Bang at the farm of Thurebylille, in Zealand. In May, 1892, the entire herd, consisting of 208 animals, was tested with tuberculin. Although the animals seemed healthy, and there had been no special amount of infection suspected, 80 per cent. of the milch cows and 40 per cent. of the bulls, heifers, and calves reacted. While the herd was out at grass, the two sections being kept apart, the byre was thoroughly disinfected, and divided into two parts by a wooden partition, covered on one side by felt. A separate staff was told off to look after each section, with orders not to go from one to the other. It was decided to test the healthy section twice a year, and the calves of the tuberculous section as soon after birth as possible.

In October, 1892, the healthy section consisted of seventy animals, of which seven reacted, and were removed to the tuberculous section. In May, 1893, the healthy section consisted of 103 animals, of which ten reacted, and were removed to the tuberculous section. After this the isolation of the two sections was enforced more rigorously. In October, 1893, the healthy section consisted of 107 animals, of which one reacted. In May, 1894, the healthy section consisted of 122 animals, of which two reacted. In October, 1894, the healthy section consisted of 119 animals, of which one was suspicious. In May, 1895, the healthy section consisted of 136 animals, of which none reacted. The tuberculous section at this time consisted of sixty-nine animals.

The few animals bought during these three years were tested with tuberculin before being introduced into the herd. Most of the calves born during this

period were the calves of tuberculous cows; but none of them have developed tuberculosis, with the exception, perhaps, of one calf, which, when tested at the age of six and a half weeks in November, 1894, gave a reaction. These results seem to show that a healthy stock may be bred from a tuberculous stock by the simple precautions of separating the healthy from the infected animals and boiling the milk of the tuberculous cows.

This is not an action of to-day, as in 1897 there had been tested in Denmark 144,800 cattle, and the results were highly satisfactory. In other countries tuberculin is being used with successful results. One instance may be quoted, carried out by Professor Dewar in Great Britain on the Castle Craig herd, in which the *post-mortem* examinations made proved the test reliable.

Nearer home we have Mr. Pound, F.R.M.S., of Queensland, who writes—"During the last three years somewhat exhaustive experimental investigations conducted in Queensland have shown that when the tuberculin test is applied with judicious care it is practically infallible. Moreover, it has proved itself of incalculable benefit to stockowners, and is very easy of application."

Personally my experience has been small, but it has been satisfactory.

The indiscriminate use of tuberculin would not be advisable, but as a means for reducing the number of tuberculous animals in our milking herds it is undoubtedly of the greatest value. It can only be used with quiet animals, and is only required for milch cows, heifers, and bulls. To attempt to test our general herds would certainly only result in failure.

Many instances of the successful testing of cattle by leading scientists could be mentioned; and the tuberculin test is in general use in France, Denmark, Belgium, Germany, Norway, and Switzerland. Under Government control it would be of the greatest value and assistance to our farmers and dairymen where the production of milk, butter, and cheese forms so important a part in their living, besides insuring a healthy supply of food for the community.

STOCK NOTES.

By C. J. VALENTINE, CHIEF INSPECTOR OF STOCK.

Reports of the general health of the flocks have been favorable. In the South-Eastern district the sheep are very free from tick and lice, it only being necessary to press owners to dip a few small flocks for tick, and one for lice. The continued care of most owners in dipping has been most satisfactory in the results. In the Lower North the sheep examined were clean, but further inspection will be necessary. In the South there are still owners who will evade the regulations, and not dip after shearing, but there is an increase in the number who dip.

Stomach worms have occasioned losses, but not heavy. Deaths from impaction have been greater this last season than hitherto, and flock-masters should, by change of food, try to prevent losses. A few cases of cancer were destroyed, and a number of sheep suffered from cotton and felt balls. Ophthalmia, which was prevalent last quarter, has disappeared—immediate action should be taken to bathe the eyes with a lotion of opium and water, or spirits and water.

After some years of freedom from pleuro-pneumonia in the South-East district, two outbreaks occurred in cattle taken from Queensland and the Northern district; nine cattle were destroyed, eight of which tuberculous; one lot was quarantined and inoculated; the others, being in good condition, were isolated and killed, being free from disease were passed for consumption. Another lot of the same description were inoculated, and have remained free from any outbreak. No South-Eastern cattle were affected, and no other outbreaks were reported. The quarantine grounds remaining free last quarter were released. The cattle in the Northern districts have remained free from disease.

Fifty-five cattle affected with tuberculosis were destroyed, and others were isolated for fattening, and further inspection and examination when killed. In a few cases tubercle bacilli were found in the udder and milk. Twenty-four cattle were subjected to the tuberculin test; three reacted, and will be watched and, if possible, will be fattened and killed under inspection. Nine cases of cancer occurred, and the animals destroyed. Nine cattle were affected with actinomycosis—three were destroyed, four were killed and partly destroyed, and two were isolated for fattening.

Indigestion, impaction, and other local ailments have caused heavy losses throughout the country; 184 deaths have been recorded, and it is considered this is a small proportion of the losses from these causes. The inspectors have advised the necessary course of action to prevent losses, such as drenches, tonics, and change of food. It is satisfactory to know that numerous reports have been received from owners who followed the advice of the inspectors of their being successful in saving a good many cattle. The losses of milch cows have been especially heavy, attributable no doubt to the system being reduced by the strain of milking. For breaking the quarantine regulations and exposing diseased animals for sale the owner was fined £5 and costs. One owner was fined for branding sheep with a brand for which he had no claim to.

Strangles has been prevalent amongst horses in the Lower North, but the attacks do not appear to have been virulent, as no losses were reported. The effects of the fumes from the smelters at Port Pirie has been unfortunate, resulting in one farmer having lost five valuable horses from "leading," and others are affected. The severe drought in the North and Western Queensland has entirely stopped the introduction of cattle from that country, and the losses in South Australia certainly have been heavy. A few fat cattle have been imported from Victoria for the Adelaide market.

WEATHER AND CROP REPORTS.

BAKARA (April 27).—The weather for the month has been very dry, which has somewhat checked the growth of the feed and wheat. Seeding operations are well advanced, and stock are in good condition.

BALAKLAVA (April 22).—On the 2nd of the month a good steady rain fell, averaging over 1 in., which enabled farmers to push on with work on the fallows. During the last few days heavy showers have been falling, which will keep the feed growing and start the wheat. Drilling has commenced, but a number of farmers cannot start, as manures have not come to hand yet; but in a week or so seeding will be in full swing. Feed is making a start, but heavier fall of rain is required to send it on properly.

BOULEROO SOUTH (April 22).—Seeding is in full swing. The weather is very dry, and tanks are very low. Lambing is fair, but some rain would be beneficial, as the feed is too dry to keep the ewes in milk for the lambs. Still, the percentage promises to be fairly good.

BRINKWORTH (April 25).—The weather has been very changeable during the last month, with only light falls of rain, which are not enough to start the wheat. Grass is very scarce. Seeding operations are being pushed on with, but farmers have, in many cases, been delayed through late arrival of manures. Water-carting is general.

CARRINGTON (April 22).—There has been no change in the weather since last report, with the exception of a few showers of rain in the beginning of the month, and a little more during the last few days. A good downpour is wanted to give feed and wheat a start. Feed is getting scarce, and stock expected to be very poor. This will be a trying winter for all kinds of stock. Seeding operations are nearly finished, and if rain will fall soon a good deal more will be put in, as some of the ground is now very hard for tillage. The drill with superphosphate is to be tried on some of the farms.

CRYSTAL BROOK (April 26).—The season opened well, 1½ in. of rain falling about April 1st, but since that the weather has been dry, and more rain is badly needed to keep the grass growing and to enable ploughing to be finished. Early-sown wheat is up, but unless rain falls soon it will be patchy. Many farmers have been delayed in their seeding operations owing to their orders for manures not being filled. Seed drills are still coming into this district. Stock are looking better than they have done for years at this season.

GAWLER RIVER (April 22).—Farmers are working the fallows, preparatory to seeding. A few have commenced seeding, but it will not be general for a week or so. Feed is springing up, and will be greatly benefited by the heavy showers of last week. Lambing is in progress, but dry feed is rather scarce. Dairy cows are coming in and are in fair condition, greater attention being given to feeding than was the practice a few years ago. The orange crop promises to be exceedingly good.

JOHNSBURG (April 22).—Seeding is just about completed. The weather is very dry, and rain is anxiously looked for. There is little feed in the paddocks, and stock require to be fed or removed. Where there is saltbush the stock are fairly well, but there is not much nutriment in the bush when seasons are so dry. Dams are getting low. Weather cold and rough.

KAPUNDA (April 19).—Some farmers have commenced seeding, but very little can be done until more rain comes.

LUCINDALE.—Splendid rains have fallen this month. On the western side of the district the country is completely flooded, and is quite as wet as in the depth of winter. Farmers are busy ploughing. A large quantity of commercial fertilisers will be used this season.

MILLICENT (April 22).—Splendid rains have fallen this month, and feed got a good start, as the weather has been quite mild, early green crops coming on well. Potato crops turning out fairly good. Ploughing in full swing. Stock generally looking very healthy and in good condition. Rain for the month, so far, close on 6in.

MOUNT REMARKABLE (April 18).—Since last report half an inch of rain has fallen. Feed is getting scarce, and good rains are badly wanted to render the land more fit for seeding operations. The use of the drill will be almost universal this year about here.

NANTAWARRA (April 18).—Some nice rains have fallen and started some of the feed, but there is not enough growing for stock to do well on. Rainfall for the year, to date, 2·86in. Most farmers have just started seeding, and would be glad of more rain, as the ground is dry on top, but damp underneath, so any seed that is drilled deep will grow, but the shallow sown will run the risk of malting.

PENOLA (April 27).—Some fairly good rains have fallen. Young lambs are now to be seen in the paddocks. Stock generally are in good condition. Young green grass is plentiful. The vintage is now about over at Coonawarra; the crop was the largest ever picked. Ploughing is now in hand, and some crops are already sown.

PINE FOREST (April 22).—Good rains have fallen this month, and farmers have been able to get on with seeding. A large area is being put under with the manure drill, broadcasting being almost unknown. Some crops are already up and making good growth. The feed on land manured last year promises to be earlier and better than is usual.

PORT ELLIOT (April 26).—Splendid rains fell about the beginning of the month, but the ground is still dry on the surface.

PORT PRIDE (April 22).—Unfavorable weather for wheat-growing. Wheat sown in March is doing well on account of the rain early this month. The rain that has fallen since is not sufficient to start the seed. The use of the drill is extending, but there is a difficulty in obtaining manures.

RICHMAN'S CREEK (April 20).—A large area of land has already been put under crop, but a number of farmers are at a standstill for want of rain. About an inch only has been recorded to date for the year, and the break-up of season is anxiously looked for. Stock are still in fair condition; but feed is getting very short.

RED HILL (April 25).—Grass has made a start, but there has not been enough rain to keep it growing, and rain is badly wanted to make green feed for lambs. Dry feed is still fair. Sowing is general on most farms, but the ground is too dry, and some farmers are waiting for rain to make rubbish grow and get the land in good condition for sowing.

SADDLEWORTH (April 23).—The recent light rains are most welcome, as many have been able to get on with seeding. A few lambs have already appeared, and early feed badly needed. The growth of self-sown wheat on burnt stubbles, on which sheep had previously been run, is very strong, and shows a great contrast to stubbles on which no stock had grazed or trod in the grain.

STANSBURY (April 25).—The first of the month brought good rains that gave the ground a good soaking and started the feed, which is growing fast, but cold dry weather has followed, and seeding operations are somewhat delayed. Another good rain is looked for.

WILSON (April 26).—Very dry and cold weather. A few slight showers fell during last week. There is scarcely any feed to be seen anywhere.

IN PLACE OF BAKING POWDER.—To each quart of flour add one teaspoonful of pulverised carbonate of soda, thoroughly mixed; then, when mixing paste with this flour use the juice of one lemon with the milk or water used; or, if lemon is not at hand, dissolve half a teaspoonful of citric acid or of tartaric acid.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

May 1, 1901.

The unsettled weather conditions that prevailed when last writing brought within a few days nice rains, giving up to 1½ in. over nearly all the agricultural districts, and, being followed by warm weather, growing feed quickly made a good show, but further necessary moisture not forthcoming owing to a dry spell supervening, vegetation was again checked, so that with the cool season approaching abundant winter feed can only be looked for in very favored spots. In the outside pastoral country, feed and water are generally good, though as usual in some parts of this immense territory there are always places crying out for rains.

Trade generally is quiet, though in some branches retailers and manufacturers are very busy in connection with the forthcoming royal celebrations in Melbourne and Adelaide. The continued low price of lead still threatens further diminution in the wages list on the Barrier mines, making business there somewhat unsettled. In the North good work doing in developing copper shows, and prospects continue encouraging.

During the month breadstuffs showed but little activity until towards the end, when European markets brightened up a bit, and offers from there are being freely made at 29s. 6d. per quarter c.i.f., United Kingdom, whilst for cargoes close at ports of call it is said over 30s. has been paid. Latest reports state that crop prospects in the northern hemisphere are generally favorable. The value of wheat locally has responded to the better tone prevailing, and there is a little more activity shown in the flour trade, owing to a vessel each loading about 1,200 tons for South Africa and India. Home trade is mostly confined to delivering bakers' orders out of contracts made at beginning of the season. Bran and pollard showed signs of weakening during the early half of the month, but have again firmed up, and stand now as when last quoted, with millers' stocks very low and strong demand from Western Australia. Without much business doing in the line, forage has all round a healthier tone. Feeding grains are nominally about 2d. per bushel better, and have a couple of shillings a ton higher. Melbourne is doing a brisk trade with Western Australia in chaff, but freight arrangements from South Australian ports preclude our producers from participating in what should be their natural trade. Although Melbourne is half as far away again as Adelaide from the buying market, much better facilities exist for doing trade with the Victorian capital at even lower shipping charges.

Potato values have fluctuated somewhat, under the influence chiefly of inter-State quotations. Imports are increasing as local supplies prove their insufficiency, so that the future of the market will probably be a reflex of inter-State values. Prices gave way up to 15s. per ton for a few days, but have since recovered, and at moment the market is decidedly strong. Onions, as expected, further advanced early in the month, but are now stationary and well held, whilst stocks do not seem more than adequate for local wants this side of the new crop.

The hopes of dairymen were raised by the nice rains previously referred to which for a time made it seem possible that good winter feed might be ensured, but dry cold weather continuing during the past couple of weeks has destroyed the chances of a bountiful winter for grass. Heavy shipments of butter have been reaching Port Adelaide by every steamer from the eastern ports, New Zealand especially sending large consignments, so that values gave way. The importation of cream from Victoria was checked by the heavy deliveries of New Zealand butter, but there are signs of increased activity again, as local supplies of butter must be insufficient for a month or so. Eggs have been in full supply, but strong local and Western demand has kept the market steadily advancing in price, so that the month's business again proved satisfactory to poultry-owners. Local cheese have been almost sufficient to supply the market, although some small importations were made, but values yet are not high enough to permit handling these profitably, and the price seems at a standstill for a time. Heavy demand has existed for bacon, so that brisk trade at advancing price can be reported. The extreme rates ruling for butchers' meat give promise of an active winter's trade in bacon and ham as well as increasing demand in other produce lines. There has been a steady sale for honey, but no improvement shown in the late abnormally low selling rates; beeswax brisk. The crop of almonds this season is light, whilst ordinary trade has been supplemented by inter-State inquiries, so that the demand for the line has shown very great increase; but even at an advance on quotitious heavy orders could not be filled.

The Fridays' sales of carcass pork and veal during the month have been brisk, buyers keenly competing for all submitted. Good prices have been realised, and it looks as if higher rates will prevail during the winter. The dearth of butchers' meat is also causing poultry to sell better, the slight easing shewn a month ago being succeeded by brisk markets at quite up to previous high rates, even for turkeys, the only line that fell away in price this year.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide, 2s. 8d. to 2s. 8½d.; outports, 2s. 6d. to 2s. 8d. per bushel of 60lbs.

Flour.—City brands, £6 to £6 5s.; country, £5 17s. 6d. to £6 per ton of 2,000lbs.

Bran and Pollard.—10d. to 10½d. per bushel of 20lbs.

Oats.—Local Algerian and dun, 1s. 9d. to 2s.; prime stout feeding, up to 3s. per bushel of 40lbs.

Barley.—Malting, 3s. 3d. to 3s. 8d.; Cape, nominal at 2s. 3d. per bushel of 50lbs.

Chaff.—£2 15s. to £2 17s. 6d. per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.

Potatoes.—Gambiers, £4 12s. 6d.; Tasmanians, £5 15s. per 2,240lbs.

Onions.—Locals, £7 10s.; Gambiers, £7 8s. per 2,240lbs.

Butter.—Creamery and factory prints, 1s. 4d. to 1s. 6½d.; private separator and best dairy, 1s. to 1s. 3d.; store and collectors', 1½d. to 1s.; N.Z. bulk, 1s. to 1s. 1d. per pound.

Cheese.—S.A. factory, 7½d. to 9d. per pound.

Bacon.—Factory-cured sides, 7½d. to 7¾d.; farm lots to 6d. per pound.

Hams.—S.A. factory, 8d. to 9½d. per pound.

Eggs.—Loose, 1s. 4d.; in casks, f.o.b., 1s. 6d. per dozen.

Lard.—In bladders, 6½d.; tins, 5½d. per pound

Honey.—Up to 2d. for best extracted, in 60lb. tins; beeswax, 1s. per pound.

Almonds.—Soft shells, 6d.; kernels, 1s. per pound.

Gum.—Best clear wattle, 2d. per pound.

Carcass Meat.—Bright shop pork, 4½d. to 5½d.; good baconers and medium shop porkers, 4d. to 4½d.; heavy and dull, 3d. to 3½d.; veal, very saleable at 3d. to 4d. per pound for fair quality, choice, up to 5d. per pound.

Dressed Poultry.—Turkeys, 7d. to 8d.; fowls, 5½d. to 6d. per pound.

Live Poultry.—Good table roosters, 1s. 8d. to 2s. each, prime heavy, up to 2s. 6d.; fair cockerels and good hens, 1s. 3d. to 1s. 7d.; small to medium birds, 1s. to 1s. 2d.; ducks are scarce, and fetch 1s. 10d. to 2s. 5d. for fair to good, small birds lower; geese in demand at 2s. 10d. to 3s. 9d., prime, to 4s. 3d.; pigeons, 4½d.; turkeys, 5½d. to 7½d. per pound, live weight, for good to prime table birds.

Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

MISCELLANEOUS NOTES.

SALTED CUCUMBERS form a large item in the income of a multitude of farmers in Russia, the German States, and the American States. They are called "pickled," just as we speak of "pickled" pork. Large tanks of the strongest brine are prepared, and the "cukes" are thrown into these. After lying in pickle for about six weeks the cucumbers are taken out and sorted into various sizes and graded for color and perfection of shape, and then they are ready for sale in large bottles, tubs, or pails. Many manufacturers flavor their pickle with various substances. Some use vine leaves, or even laurel (or bay) leaves. Others use pepper and many other substances, whilst several employ strong brine only.

AGRICULTURAL EDUCATION.—In respect to technical and practical teaching in country schools in Belgium and Holland, Mulhall (statistician) says—"The farmer is taught agriculture and husbandry in the schools, upon both advanced and economic lines; he is taught to keep accounts, to show the cost of production—that is to say, what it would cost to produce a pound of cheese, butter, or pork, or a bushel of corn. The girls receive practical demonstrations in cooking and housekeeping, and not only in connection with food, but clothing and all other household expenditure are dealt with to instruct the girls in the best methods of home economy. The copybooks are really manuals of household thrift. These institutions are known as *Écoles Manageres*, and those in the country rural districts are specially adapted for farmers' sons and daughters."

DRY-CURING PORK.—Lay your flitches of bacon on a stone floor, or on stone scones in a cool, airy, sunless, but not damp apartment. Rub them on both sides with common salt; leave for a day, then rub it off. Then prepare a mixture in the following proportions:—6lbs. salt, 1½lbs. brown sugar, 4ozs. saltpetre. Be sure not to over-dose with saltpetre or the flavor will be injured. Spread a thin layer of this mixture on each side of the flitches, and let them

lie in it for a month, turning and rubbing them every day, giving more of the salt mixture when necessary. Be careful to rub well into the folds, ends, &c., and examine daily to see if there are any spots turning mouldy and clammy, when these must be removed. At the end of a month hang up to dry in a cool airy room, or smoke for a week.

FOUR THIEVES' VINEGAR.—During the great plague in Paris four men banded themselves to rob the houses that were plague-stricken. They escaped contagion, but were taken by the police, and were liberated by the Government upon revealing the secret of their immunity. This proved to be the following preparation, with which they sponged their bodies in every part:—Fresh common wormwood, Roman wormwood, rosemary, sage, mint, and rue, of each $\frac{3}{4}$ oz.; lavender flowers, 1 oz.; garlic, calamus aromaticus, cinnamon, cloves, and nutmeg, of each 1 drm.; camphor, $\frac{1}{2}$ oz.; alcohol, 1 oz.; strong vinegar, 4 pts. Digest all, except camphor and spirit, in a closely-covered vessel for a fortnight at summer heat, then express and filter the vinegar produced, and add the camphor previously dissolved in the spirit. A small quantity of this burned in a saucer will drive mosquitoes out of a room.

REALLY GOOD LIMEWASH.—Take $\frac{1}{2}$ bush. of unslacked lime. Slake it with boiling water. Cover during the process to keep in steam. Strain the liquid through a fine sieve or strainer. Then add to it a peck of salt previously dissolved in warm water; 3 lbs. of ground rice boiled to a thin paste and stirred in while hot; $\frac{1}{2}$ lb. of Spanish whiting, and 1 lb. of clean glue, previously dissolved by soaking in cold water and then by hanging over a slow fire in a small pot hung in a larger one filled with water. Add 5 galls. of hot water to the mixture, stir well, and let it stand a few days covered from dirt. It should be applied hot, for which purpose it can be kept in a kettle or portable furnace. A pint of this whitewash mixture, if properly applied, will cover 1 sq. yd. It is almost as serviceable as paint for wood, brick, or stone; and is much cheaper than the cheapest paint. Coloring matter may be added as desired. For cream color add yellow ochre; for pearl or lead color add lampblack or ivory black; for fawn color add proportionately 4 lbs. of umber to 1 lb. of Indian red and 1 lb. of common lampblack; for common stone color add proportionately 4 lbs. of raw umber to 2 lbs. of lampblack.

FRUIT FROM OLD MELON SEED.—A writer in the *Gardeners' Chronicle* describes his experience in raising melons from old seed as giving better results than from young seed. His observations, which entirely confirm that of previous observers, are as follow:—"In a small melon-house I noticed two plants, which were very vigorous, and survived the first crop. They produced a good second crop of female flowers, but somewhat smaller, as were the male flowers, than usual. In the same house was a batch of young plants, with good male blossoms. I fertilised the females of the older plant with the pollen from the younger. The crop of fruit was nearly double that of the first. The fruits were large and of excellent quality throughout. A year or two afterwards, having to supply ripe melons in May and onwards, and having noticed that plants from old seed produced a less succulent growth than did those from young seed, for four years I raised my plants from old seed, always growing a few plants from new seed. I then fertilised the female flowers of the older plants with the pollen of the younger, which plants were invariably the more robust. The resulting fruits were more reliable in good quality, and though the female flowers had been small, the fruits were large, weighing from 3 lbs. to 7 lbs." Mr. Henslow has given very similar experiences on the Continent in his "Origin of Floral Structures," p. 247. M. F. Cazzuola, in addition, found that melon-plants raised from fresh seeds bore a larger proportion of male than female flowers; while older seed bore more female flowers than male.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, APRIL 15, 1901.

Present—Messrs. F. Krichauff (Chairman), W. C. Grasby, M. Holtze, R. Homburg, M.P., Thos. Hardy, Professor Lowrie, H. Kelly, T. B. Robson, C. J. Valentine, and A. Molineux (Secretary).

Professor Lowrie and the Agricultural College.

Mr. HOMBURG called attention to report in the daily press of the proceedings of the Conference at Strathalbyn, and, on being informed they were substantially correct, said it was apparent that Professor Lowrie's remarks had been made under the impression that at the previous meeting of the Central Bureau he (the speaker) had reflected upon the work done by the Professor. He also regretted to note that the Secretary had, by interjection, confirmed the Professor in that opinion instead of putting him right. As the members knew, any remarks he made at the previous meeting were founded upon Mr. Molineux's statement that the Professor had too much work put upon him, and it was solely with a view to relieving him of some of this work that he brought the matter forward. In the daily press his remarks had not been correctly reported. He did not call the experimental and other work carried out by the Professor drudgery, but referred to departmental and other matters which could well be left in the hands of an assistant.

Professor LOWRIE said his remarks at Strathalbyn were founded upon the reports in the newspapers that members of the Central Bureau were of opinion that his work at the College was drudgery. He made special reference to the experimental work at the College in respect of fertilisers and varieties of wheat, which was distinctively scientific in character and of great public value. The College farm, notwithstanding its limited area, was self-supporting, and he considered this showed his time was not wasted; in fact, he considered the farm operations the best part of his work. He admitted he felt somewhat hurt that the press should have stated that the Central Bureau, instead of showing the advantages and possibilities of farming, should have characterised it as drudgery. He was glad that the misunderstanding had been cleared up. The part of his work (if any) that was most like drudgery was the departmental work, which, as far as he knew, no other Professor of Agriculture had to undertake. In regard to the appointment of the committee to deal with the improvement of wheats, he would agree to act on the same, but he regretted that the members had not made themselves acquainted with the work they were doing at the College before discussing that work. Several years ago the heads of the different Agricultural Departments met in Sydney and appointed a nomenclature committee for wheat after thoroughly discussing the matter of improvement of wheats. At the Melbourne Red Rust Conference the matter was again discussed, and it was arranged that the crossbreeding of wheats should be undertaken by Mr. W. Farrer, of New South Wales, the best man he knew of for the work, while the heads of the Agricultural Colleges should undertake the "fixing" of suitable types originated by Mr. Farrer. This had been done for several years, and much good work had been carried out. There were many difficulties in the way of improving their wheats all round. He had been criticised for advocating King's Early wheat, and admitted its deficiencies, but the fact remained that he would make more profit out of King's Early at 2s. per bushel than from many crossbred wheats of higher quality at 2s. 6d. per bushel. They must not get away from the fact that the final factor was the cash returns obtainable. He might mention, in connection with this matter, that at a recent scientific meeting in France the grandson of the man who

had started first in the improvement of wheat stated that, notwithstanding the great strides made, it was a fact that some of the oldest wheats gave a greater profit per acre than the best of the crossbred wheats they had raised in France. Personally he could not see what good a non-scientific committee could do.

Considerable discussion ensued on the question of improvement of wheat. The Chairman thought the members would not have agreed to the appointment of the committee had the information the Professor had given them been available at the previous meeting. The suggestion was made that the resolution should be rescinded, but Mr. Grasby pointed out that there were other ways of improving the reputation and quality of our wheat than by crossbreeding, and thought that the committee might do good in dealing with the subject generally. It was finally decided to let the matter stand over till after the Annual Congress in September.

Annual Congress.

It was decided that the thirteenth Annual Congress of the Bureau be held in Adelaide during show week next September.

Mr. KELLY regretted that the attendance at Strathalbyn Conference was so poor. Professor Lowrie had been to immense trouble in preparing charts, &c., to illustrate his remarks on the use of fertilisers at the College, and instead of there being several hundred farmers to hear him there were only about thirty. In view of the value of the Professor's address, he moved that he be asked to repeat it at the September Congress. This was seconded and carried, and the Professor expressed his willingness to do so.

Use of Fertilisers.

In reply to question, Professor Lowrie stated he noticed early last summer the statement that the use of fertilisers had caused the wheat to blight when the hot weather set in, and had taken every opportunity to refute it. Like other rumors, it had grown as it travelled until they had the Premier of the colony giving publicity to it. Personally he was as positive as it was possible for anyone to be that the fertilisers were not responsible for the damage done. He believed that where the fertilised crops had suffered from the first burst of hot weather it was because the fertiliser had accelerated their ripening, which in five years out of six was a distinct advantage, with the result that they were out in bloom when the two or three successive days of hot winds occurred. As every farmer knew, wheat was most susceptible to damage at this time, and the unmanured wheats, being more backward this year, escaped. So far only could the fertiliser be made responsible for the damage. In regard to the effect of fertilisers in dry seasons, the return at the College in 1897 from land receiving 2cwts. super. per acre was 22bush. per acre, and during that year the rainfall recorded at Roseworthy was only 12.1in., while last year it was 19in.

Professor LOWRIE also referred to the practice a number of farmers had adopted of distributing small quantities of fertiliser broadcast before seeding, and afterwards broadcasting the seed, the object generally being to expedite operations at seedtime. He would do all in his power to "nip in the bud" what he could only consider a mistaken practice. If the land had by previous manuring and cultivation been brought back to a normal state of fertility the practice of broadcasting the manure might be regarded as fairly satisfactory, as any deficiency in the crop might be fairly compensated by the saving of time and labor when seeding. If, however, as was usually the case, the manure was needed to give the wheat a good start and to encourage root growth during winter when unmanured crops so often languished, the practice of broadcasting such small quantities as 75lbs. to 100lbs. per acre was a mistake. Farmers would be better advised when using small quantities of manure to put it in with the seed.

Sheep on Farms.

Mr. VALENTINE said the practice of keeping sheep on farms had received considerable attention of late years from the Branches, but he was strongly of opinion that there was room for a considerable extension of this part of the farm operations. Practically every farmer should keep more or less sheep according to the size of his holding. The land out of cultivation and the fallows could be utilised with profit to the owners. He moved—"That a circular be sent to the Branches of the Bureau calling attention to the necessity of sheep being kept on farms, and asking that discussion be initiated on the great value and importance it is to the farmer, both for the purpose of cleaning the land and as a means of obtaining an increase in his income." Carried.

Codlin Moth.

Mr. ROBSON called attention to the prosecution of persons for selling apples infested with codlin moth caterpillars, and moved that the Bureau ask that the regulations prohibiting the sale of fruit be rescinded. In his opinion the regulations had been an utter failure and should be done away with, giving clean districts power to keep out all infested fruits.

On the suggestion of Mr. Homburg, Mr. Robson agreed to withdraw his motion, and gave notice of similar motion for consideration at special meeting of the Bureau to which the Inspector of Fruit (Mr. George Quinn) will be invited.

Bird Pests.

Mr. HARDY said he would again call attention to the depredations committed by the various birds, principally sparrows, starlings, and crows, in vineyards and orchards. During the past vintage the damage had been greater than ever; in fact, but few vigneron were aware of the losses they suffered. Not only was there the expense of attempting to keep them away, requiring four or five men or boys on 100 acres of vineyard, but heavy losses resulted owing to light rain or heavy dew causing the broken berries to decay. It was simply impossible to make good wine from half-rotten berries, so that the effect of the depredations of the birds was far-reaching. What was required was that the provisions of the Sparrow Destruction Act should be extended and made compulsory. At present the district councils *may* take necessary action to compel the destruction of sparrows, whereas the Act should be altered and the word *shall* substituted for "may." If all local bodies offered a reasonable price for heads and eggs there would soon be a considerable decrease in the numbers of the birds. He would bring the matter forward again in more definite shape.

Railway Rates for Carriage of Fertilisers.

In reply to question by Mr. Kelly, the SECRETARY said this matter was still before the Minister. Delay had taken place in obtaining particulars of rates charged in the adjoining States. With the exception of Victoria, the rates charged in South Australia were no higher than the others, while the Victorian rates were only temporary as an experiment.

Extracts and Translations.

The CHAIRMAN tabled the following:—

"*Annual Forage Plants for Summer Pasture*" is a bulletin issued by the Nebraska Experimental Station. There, as here, it is recognised that the permanent pasture plants are inadequate, except Alfalfa, which certainly furnishes succulent midsummer fodder or pasture. Grasses and other perennials suffer so much during the dry hot season as to diminish greatly the flow of milk. Alfalfa, however, will not succeed everywhere, and it often produces bloat. Plots one-fifth of an acre were sown at such times as were the most favorable for germination and development. When the growth of the plants was considered fit for pasture, movable

fencing was put around the plots and a Grade Jersey was placed in the enclosure, where she remained as long as it afforded pasture enough with a daily ration of 2lbs. of bran and 2lbs. of ground corn added. Water and shelter for the cow was provided to make the cow comfortable. Each cow had been pastured on Alfalfa at least one month before, and again often being enclosed in a test plot. The cows were weighed once a week while on Alfalfa, and twice a week on the test block, to ascertain whether they gained or lost in weight as compared with the Alfalfa. They were milked twice a day, and the weight of all milkings divided by the number of days before, within, and after being taken out of the enclosure, so as to indicate the effect of the food on the milk flow. The percentage of butter fat was also determined twice a week. Duplicate plots of one-tenth of an acre allowed to grow until they reached a stage which would afford the largest amount of green forage. Omitting the results from some crops that were poorer than usual, the feed produced by those duplicate plots and the number of days the cows were depastured on the one-fifth of an acre plot—

	Oats and Peas.	Vicia Villosa.	Indian Corn.	Millet.	Sorghum.	White Kaffir Corn.	Yellow Millo Maize.
1. Number of days pastured	22	16	23	20	32	22	24
2. Weight (lbs.) of green forage on duplicate plot	3,470	2,410	6,710	4,640	7,470	7,680	6,050
3. Maximum food consumption and de- struction per day (lbs.)	158	150	292	232	233	349	252

Sorghum furnished by far the greatest amount of pasture for many more days, and also after the cow had been removed from the plot. This is chiefly on account of the greater rapidity of the second growth, which, of course, cannot be included when the crop is cut—only when pastured. For medium early pasture a mixed crop of oats and peas produced most feed. The third line shows only what quantity of food would have been disposed of if the pastured plants had attained the size of those cut on the duplicate plots, thus showing the waste in pasturing of plants having woody stalks. The following are the effects upon live weight of the cows, and the average gain or loss on annual forage plants instead of on Alfalfa;—*Ityo*, +13; oats and peas, +28; millet, +14; Indian corn, +22; sorghum, +14; white Kaffir corn, +2; yellow millo maize, +3; but cow peas showed a diminution in weight of 26lbs., and *Vicia villosa* of 72lbs. The laying on of flesh was accompanied by a falling off in the milk flow, and also in a decrease in butter fat except with rye and cow peas.

Raising calves for profitable beef production at Nebraska.—Six cows, being 4-grade Hereford and 2-grade Shorthorn, were purchased on September 3, 1897, at £6 a head, which were covered by a pure-bred Hereford, and dropped calves in February, March, and April. The calves were allowed to run with their dams to August 25, when two were put in barn and started upon 6lbs. of Alfalfa hay and 1lb. of a mixed feed, consisting of in the proportion of 1lb. corn and oats ground together, 1lb. of bran, and $\frac{1}{2}$ lb. oil meal. On October 22 all were weaned and received Alfalfa and the feed mixture, which was gradually increased to 20lbs. Alfalfa and 4lbs. corn and oats per day for each calf until January 25, 1899, at which date 1lb. of bran was added to the daily ration until April 1, 1899. The total weight of the six calves was on October 22, 2,950lbs., and on April 1, 4,355lbs. The financial result is the following:—

	£	s.	d.
Cost of keeping the cows was	14	0	0
Interest on purchase-money of cows	3	8	0
Value of feed consumed by calves	8	18	0

£26 6 0

Against which the calves represent a value of about £39 4s., or a profit of £12 18s.

New Members.

The following gentlemen were approved of as members of the undermentioned Branches:—Caltowie, Mr. W. E. Hewitt; Lucindale, Mr. John McInnes; Yankalilla, Messrs. Henry J. Dennis and Chas. Saunders; Forest Range, Messrs. G. Monks and W. McLaren; Holder, Messrs. Fred. Starr, William Tuck, J. Jones, S. Pickering; Meadows, Mr. B. Brown; Appila-Yarrowie, Mr. G. A. A. Becker; Mount Remarkable, Mr. John O'Connell; Burra, Mr. F. G. Dawson; and Mount Compass, Mr. E. C. Good.

Reports by Branches.

The SECRETARY reported receipt, since previous meeting, of fifty reports of Branch meetings.

REPORTS BY BRANCHES.

Lucindale, April 6.

Present—Messrs. E. Hall (chair), A. Matheson, A. Carmichael, L. McInnes, W. Dow, A. Dow, H. Langberg, G. C. Newman, and E. E. Dutton (Hon. Sec.).

DAIRYING.—Discussion on question of purchase of pure-bred Holstein bull took place, and it was decided to postpone decision on the matter for a few months in order to ascertain, from the development of the progeny of the Holstein bull now in the district, whether the cross with the local cows would prove suitable.

BUREAU WORK.—Mr. L. McInnes, who has been a member since the inception of the Branch, tendered his resignation, on account of inability to attend meetings regularly. He had learnt a great deal while a member which he would have liked to have known twenty years ago. He would like to see the young men joining the Bureaus, as they would receive much good from their membership.

GREEN FEED.—Mr. Newman reported that, owing to the dry summer, kale planted in September last year was a complete failure.

Caltowie, March 4.

Present—Messrs. A. McCallum (chair), J. G. Lehmann, J. A. Leahy, G. Petatz, J. Noonan, S. Wenham, J. H. Both, and A. McDonald (Hon. Sec.).

YIELDS OF WHEAT.—Chairman stated that Mr. G. Burton, Belalie, had harvested eight bags (32bush.) per acre from Dart's Imperial and six bags per acre from Purple Straw wheat. On his own farm the Chairman had reaped five bags per acre of Gluyas, weighing only 63lbs. per bushel, and the crop went down badly; Smart's is a good wheat, and Surprise is the best for weight and is a first-class milling wheat. Mr. Noonan had grown a bearded variety known as Angora, which is late, but grew 2½ft. higher without manure than another sort grown with manure alongside. A neighbor had harvested eight bags per acre from Purple Straw. Blucy and Baroota Wonder were both prolific varieties. A majority of members voted for Purple Straw and Rattling Jack as best all-round wheats, and Smart's and Petatz Surprise as best early sorts.

FIG TREE BORER.—At previous meeting Mr. Neate tabled branches of fig tree tunnelled by some grub, which quickly caused the branches to die. To be sent to General Secretary for identification. [Report of this meeting, held February 4, reached this office on April 2, but the specimens have not yet arrived.—GEN. SEC.]

NOXIOUS WEEDS.—Mr. A. McDonald read a paper to the following effect:—

Noxious weeds are becoming numerous, and the area over which they extend affords matter for anxious consideration how best to prevent their damaging influences. Every now and again comes news from some part of the State of the appearance of a new weed, and those we have suffered from in the past still continue to spread and thrive, with but little effort being made to arrest their progress. In this district the star thistle is rapidly increasing on roads and uncultivated land, and will surely in time invade our paddocks and cultivated fields. Wild mustard, two sorts of poppy, and other weeds are rapidly increasing; and it is noteworthy that these latter four weeds first appear and are most abundant along railway lines and about the stations. Probably the seeds are conveyed in chaff along the lines, and others may be introduced in packages, wrappings, seeds, and goods from other countries. [He then referred to the poisonous Cape bulb spreading near Yankalilla, and the wild cotton growing near Burnside, Beaumont, and amongst the adjacent mountains.—GEN. SEC.] At present, when a new noxious weed is discovered and is spreading, nothing can be done to enforce its extermination until both Houses of Parliament

have become convinced that it is necessary to declare it "noxious within the meaning of the Act." Then a proclamation must be published in the *Government Gazette*, regulations framed, and then no machinery is usually provided for putting the Act and regulations into force. Not only this, but lands under control of the Government and of local governing bodies are allowed to become covered with noxious weeds, which produce seeds to infest adjacent properties. Landowners must combine to urge on the strict administration of the laws against noxious weeds at present existing, and to prevent the introduction and spread of any new pests.

Some members thought the star thistle would die out in time if left alone, and others believed that stock in time might come to eat it and thrive. [Yes, when sawdust and shavings take the place of bran and chaff. The stinkwort has existed and thriven near Balhannah for about fifty years and is not extinct yet, nor is the plant yet equal to kangaroo grass as a fodder for milking cows or other stock.—GEN. SEC.]

SHEEP WEED.—It is believed that the seed of this plant will lie dormant in the soil for many years if buried 3in. or 4in. deep, but will germinate when brought near to the surface.

Morgan, April 5.

Present—Messrs. R. Windebank (chair), H. Hahn, H. H. Plummer, J. Bruhn, G. Roediger, C. Moll, E. Jacobs, R. Wohling, E. French (Hon. Sec.), and two visitors.

DISEASES IN STOCK.—A long discussion on this subject took place. Some members were of opinion that the drought had to a large extent killed the most nutritious of the herbs that used to grow in the district, which alone was sufficient to account for all sorts of troubles with cattle. Cattle fat enough for the butcher have succumbed when there has been plenty of dry grass about, and it was thought that some substitute would need to be found for the herbs and bushes that had been destroyed. One member thought the feeding of bonedust occasionally to cows was worth trying. His own cattle ate it readily and appeared to benefit from it.

Wilson, March 30.

Present—Messrs. D. McNeil (chair), R. Rowe, T. Barnes, H. Need, H. T. Crossman, A. Crossman, W. H. Neal, H. Ward, J. Coombes, A. Canning (Hon. Sec.), and one visitor.

FEEDING HORSES.—An interesting discussion on the best feed for horses took place. One member considered, at present prices, white oats the cheapest and best; if oats were substituted for half the bran the cost would be less and the horses do much better. The Chairman thought wheat cheaper feed than bran at present, and, while a few thought it heating and productive of sore shoulders, the majority favored wheat when grown on the farm. Opinions were about equally divided as to merits of dry and soaked wheat. As a daily ration for six horses one member mixes 50lbs. hay chaff, one bag cocky chaff, and three kerosene tins of wheat that have been steeped for thirty-six hours. This is divided into three feeds, and the horses look as though it agreed with them. It was generally agreed that if horse feed has to be purchased oats would be cheapest; also that oats, chaffed hay, and bran make the best feed.

BEST WHEATS.—A discussion on the best wheats for the district took place, Steinwedel being generally favored. Plump *versus* shrivelled seeds also came in for attention. Some members held the opinion that plump seed must naturally be the better, because the plant would be stronger and better able to stand dry weather after sprouting, though it was the general opinion that shrivelled and plump grain were nearly equal if the plant gets a good start,

which unfortunately is not usually the case in this district. It was also the opinion that more plump seed per acre would have to be sown. Opinions were divided as to result of continued sowing of small seed, some thinking that small seeds would produce small heads, while others held that the dry seasons and the exhaustion of the soil had much to do with the small heads produced. It was generally conceded that plump grain would, in good seasons and with plenty of space, produce good large heads.

MANURE FOR FRUIT TREES.—A member wished to know if sheep manure would benefit trees, as he noticed that mallee shoots grew stronger where the sheep camp. [Yes; but too much must not be applied, or rank growth will result.—GEN. SEC.] The Hon. Secretary directed attention to article in December *Journal* by Mr. E. M. Sage, of Balaklava Branch, proving the beneficial effects of superphosphate as a dressing for fruit trees.

BLACK RUST.—The Chairman asked whether members had noticed any kinds of wheat more susceptible than others to this disease. Several members thought Steinwedel was most liable to it, but others thought that ploughing the land dry was largely the cause.

WEEVILS.—The Chairman asked for best method of destroying weevils in bran and about bags and buildings.

Quorn, April 6.

Present—Messrs. R. Thompson (chair), J. B. Rowe, F. Herde, G. Altman, G. Walker, H. Altman, C. Patten, Jas. Cook, and A. F. Noll (Hon. Sec.).

BACON-CURING.—Mr. Jas. Cook tabled a roll of bacon twelve months old, which was considered of very good quality by the members. He also read a paper on the subject. Most farmers' pigs were fed upon corn and milk, which was not always the case with pigs treated at the bacon factories. Corn-fed bacon was firmer and sweeter than from pigs fed upon slops and offal. In preparing the pigs for curing great care must be taken to clean the skin thoroughly, unless it is intended to smoke it. A good clean-looking ham or roll will always sell better. His plan was to lay the meat on a sack or slab in a cool place and dry salt it, using 6lbs. salt, 1lb. sugar, and 1oz. saltpetre for a pig weighing about 120lbs. Rub this in thoroughly and turn every other day if the weather is warm and sultry. Remove the bones from sides and hams. After two weeks wash the bacon thoroughly and leave it to dry. Next day roll the sides and place in separate bags and pack away in wood ashes in a zinc-lined case, and it will keep without injury through the summer. A little spice in the roll and hams is appreciated by many. Rolled bacon well made will pay well, as it meets with a ready sale at a fair price. Considerable discussion followed, the majority being of opinion that salting in brine was preferable to dry salting, as the rind did not get so hard. The proper way to roll bacon was to start at the back, or thick part, and finish with the belly. Mr. Walker asked whether it would pay to feed wheat to pigs. Mr. Herde said it would, but the wheat should be crushed and fed three times a day. Crushed wheat was much better than whole grain. He had killed pigs at eight months weighing 180lbs. The Berkshire cross was, in his opinion, the best.

Mundoora, March 29.

Present—Messrs. R. Harris (chair), W. Aitchison, D. Smith, C. Button, W. D. Tonkin, H. Torr, Jas. Loveridge, D. Owens, J. J. Vanstone, T. Watt, W. J. Shearer, and A. E. Gardiner (Hon. Sec.).

OFFICERS.—Messrs. K. Harris and A. E. Gardiner were re-elected Chairman and Hon. Secretary respectively and Mr. J. J. Vanstone elected Vice-chairman for ensuing year, a vote of thanks being accorded to the officers for their past services.

WHEAT EXPERIMENTS.—Mr. Smith tabled nice sample of Marshall's Hybrid wheat from Bureau seed. The plant did very well until the spring, when the hot weather set in and spoiled a number of the weaker plants. The variety was grown without the aid of manure, and appeared very suitable for this locality. Mr. Torr sowed some of the same variety on stronger soil, but it did not do so well, drying right off when the hot weather set in.

MANURES AND MANURING.—Considerable discussion on this subject took place. Mr. Vanstone called attention to Professor Lowrie's remarks on the necessity for heavier dressings of manures than were usually applied. Members were of opinion that the quantity advocated by the Professor, viz., 2cwts. per acre, was too heavy for this district. Mr. Vanstone read letter from Mr. Correll, of Minlaton, furnishing particulars of manures used in that locality, the quantity per acre, and the results. Members considered the amount used on the southern part of the Peninsula, viz., up to 1cwt. per acre, was more in keeping with the dressing found profitable in this locality than the quantity recommended by the Professor. Members were pleased to learn from Mr. Correll that the use of phosphatic fertilisers had greatly increased the grazing capabilities of the district. Members were of opinion that the alleged harmful results of manures in causing the crops to blight badly from the hot winds early in November were not substantiated, and attributed the injury to the climatic conditions, and not to the effect of the manure at all. It was generally considered that 50lbs. to 80lbs. per acre were sufficient to apply in this district.

PICKLING WHEAT.—Mr. D. Smith said he had seen it stated in a newspaper that for pickling seed wheat 2lbs. bluestone to 10galls. of water should be used. He found, however, that at this strength one-third of the wheat was destroyed. He reduced the strength to 1½lbs., and then to 1lb. to 10galls., and found the results satisfactory. [One pound of bluestone to 10galls. of water is quite strong enough. A stronger solution is not only more expensive, but is likely to be injurious.—GEN. SEC.]

CATTLE EATING BONES.—Mr. Smith had heard that beyond Hawker cattle do not chew bones, as was the case here, and he would like to know why this should be so. It was decided to ask the General Secretary if the information was correct, and, if so, why there should be such a marked difference in the habits of the cattle. Mr. Shearer had always understood that the chewing of bones was only a habit with some cows. Mr. Vanstone had noticed cattle in this locality more inclined to it than on any other parts of the Peninsula, and thought it probably due to lack of something in the feed. Mr. Gardiner had noticed some cows follow up the practice more than others, and these were usually in better condition. He thought it must be an aid to digestion.

Richman's Creek, April 1.

Present—Messrs. W. Freebairn (chair), A. Knauerhase, J. McSkimming, P. J. O'Donohue, M. Hender, A. Nicholson, J. J. Searle, J. M. Kelly, J. J. Gebert, and J. McColl (Hon. Sec.).

DEEP v SHALLOW SOWING.—Discussion on this subject took place. Mr. Knauerhase had been informed by a farmer from a neighboring district that he always ploughed his wheat in on stubble land, and found it a success. He had also noticed crops that were put in in this way did not appear to suffer so much from the dry season. Mr. Knauerhase said he had never ploughed

seed in like this, but intended to try it this year. The Chairman said the wheat if put in too deep threw out fresh roots near the surface, the tap-root appearing to die. His experience was that the crop from ploughed-in seed "laid" more when ripe than shallow-sown wheat. Mr. Gebert ploughed in the seed on portion of his land last year, and although the plant did not appear to suffer so much during the dry weather, the actual yield was no better than from the rest of the crop.

FERTILISERS AND SEED WHEAT.—Mr. McSkimming asked whether super-phosphate was likely to injure the seed if sown together during dry weather. The Chairman said last season his crop was affected to a certain extent from this cause. Some members did not think any injury would result while the soil remains dry.

BUNT IN SELF-SOWN WHEAT.—In reply to an inquiry Mr. Nicholson said last season he reaped a self-sown crop that had not been cultivated in any way, and there was a good deal of bunt in it.

COMBINED HARVESTER.—Mr. Kelly reported on this machine, shown at the Adelaide Show. He did not think it was likely to come into general use, as it seemed too complicated, and did not save the chaff—a most important matter to the northern farmers. [It has been stated that this latter objection has been overcome.—GEN. SEC.]

Hawker, March 27.

Present—Messrs. H. M. Borgas (chair), G. F. Bales, T. Laidlaw, C. W. Pumpa, J. Hill, J. W. Schuppan, A. C. Hirsch, R. Wardle, Jas. O'Loughlin, and J. Smith (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. Borgas reported that owing to the ravages of locusts he did not get back any seed from the new wheat received last year from Central Bureau. Two years previously he received a small quantity of Bartlett's crossbred wheat: this yielded 8lbs, which was sown the next year and returned 1bush., which was sown the following season, and he now had 10bush. He considered the variety likely to be suitable for this district, and under favorable circumstances it would yield well.

PREPARING LAND FOR SEED.—Discussion on this subject took place. Mr. Hill found that well-worked land did not always yield best, and thought it impossible to lay down any hard and fast rule as to the working of the soil. Mr. Borgas considered early fallow worked after rain the best, but if the land lay all the year after fallowing without rain he would not work it again before seeding. Mr. Hirsch favored early fallowing, and believed in working the fallow before seeding, whether wet or dry. If no rain had fallen since fallowing he would work it down to a good seedbed before sowing. Mr. Laidlaw was convinced that early fallow was the proper thing, although it necessitated a lot of work, for every decent shower of rain seemed to bring on the weeds. He had used the scarifier freely on his fallow and yet found plenty of weeds.

WET AND DRY SEEDING.—Mr. Bales said last season he drilled in portion of the seed while the land was wet, and right through he could see the difference between this portion and that drilled in while the land was dry. The yield also was considerably higher.

NEW PLOUGH.—The Hon. Secretary called attention to new implement made by Mr. Jas. Cameron for working the land instead of a scarifier. Mr. Wardle considered this a decided improvement on the scarifier, and believed it would come into general use, as those who had scarifiers could convert them at very small expense. Other members who had seen the implement at work expressed similar opinions.

COVERING SEED.—Discussion took place on best way to cover broadcasted seed. Most members thought two harrowings necessary, but others considered one sufficient. All members strongly advised harrowing of land sown after

Brinkworth, March 25.

Present—Messrs. J. F. Everett (chair), G. Wooldridge, A. L. McEwin, J. Graham, C. Ottens, W. Welke, J. Cross, W. Wundke, A. W. Morrison, G. Freebairn, H. J. Welke, J. Stott (Hon. Sec.), and two visitors.

PICKLING SEED WHEAT.—Discussion on this subject continued. Several members still hold the opinion that early reaped wheat is specially liable to produce bunt if sown, notwithstanding the statement of the General Secretary to the contrary. Mr. Freebairn could not account for the prevalence of bunt; he pickled with $\frac{1}{2}$ lb. bluestone and $\frac{1}{2}$ lb. salt to the bag. Mr. J. Maitland (visitor) said he always pickled his seed wheat, and had never been troubled by bunt. Mr. H. J. Welke said many years ago he saw an experiment carried out to test the effect of pickling. On new ground 1 bush. of wheat was sown after pickling, and 1 bush. without pickling. On the portion sown with pickled seed the crop suffered from red rust, but not from bunt, while of the other part of the crop half was bunt and half good grain. Mr. Freebairn said he obtained some new seed wheat one time, and sowed portion on stubble land. The rest was put in on fallowed ground by a neighbor. His own crop was quite clean, but his neighbor's was affected by bunt.

QUANTITY OF SEED PER ACRE.—Mr. A. L. McEwin read a paper on this subject to the following effect:—

Last year he read a paper in which he strongly advocated thinner sowing of wheat than was generally practised. His reasons were:—first, because he had as good, and in some cases better, crops than his neighbors who sowed more thickly; and second, because a bushel of wheat per acre meant fourteen to sixteen grains to every square foot of soil. All would admit that fourteen to sixteen plants on a piece of land 1 ft. x 1 ft. were far too many. At the latest Congress in Adelaide Mr. J. W. Dall stated that at $\frac{1}{2}$ bush. per acre there would be seven grains to the square foot. He questioned the accuracy of this statement, but the General Secretary said it was correct. He was sure, however, that with good average seed wheat this would not work out so high. There was, however, much room for inquiry on this subject of the quantity of seed to sow. He confessed that last season's experience had shaken his opinions on the subject, and this more particularly when fertilisers are used. When visiting the Roseworthy College they were shown by Prof. Lowrie the various plots sown with King's Early wheat to test the results from the use of different manures. In the March *Journal of Agriculture* they saw the result from these tests. Now, the Professor told them he sowed $1\frac{1}{2}$ bush. of seed per acre, and he was sure that a bushel to the acre was little enough to sow. A statement like this must carry great weight, as all who knew the Professor were aware that he would not make it unless he was absolutely convinced of its accuracy. He was sure that many farmers would like to see the Professor take this matter of thick and thin sowing up in the *Journal*. One thing is certain: the college crop was an excellent one, and this did not show against thick seeding. His own crop last year varied, portion being sown with 33 lbs. of seed and upwards to 55 lbs. per acre. From all appearance the lighter sowing produced quite thick enough growth, but the yield was below expectations, and less by nearly one-third of the thicker crop. Whether this was due to the dry October or to frost he could not say; in every instance the later sown yielded better than appearances indicated. He intended carrying out some experiments for himself this year, and hoped others would do the same. It would be extremely useful if a number of four or five acre plots were sown with wheat at rate of 30 lbs., 40 lbs., 50 lbs., 60 lbs., and 70 lbs. per acre. Each plot would have to be reaped separately, and some little extra trouble would be involved, but the matter was of sufficient importance to warrant this. If they could obtain several bushels per acre more by a little heavier seeding it would be distinctly profitable; but, on the other hand, if a lesser quantity gave equally as good a crop why waste the seed by putting on more than necessary? Mr. Ottens generally sowed 40 lbs. or 45 lbs. per acre, but owing to Steinwedel not stooling he sowed 70 lbs. of this. Mr. Freebairn said he had sown plots alongside, one with 40 lbs. and the other with 60 lbs. per acre, but there was no difference in the yield; 30 lbs. Petatz Surprise wheat produced a thick crop,

but the same quantity of Phillis Early gave a poor crop. Mr. Jas. Maitland would sow thinly in a dry district, but generally considered 50lbs. to 60lbs. per acre safest. Mr. Graham found 35lbs. to 40lbs., and on good land 45lbs. per acre, broadcasted, sufficient. Mr. Morrison had better results last year from thin seeding than from $1\frac{1}{2}$ bush. seed per acre. Mr. A. Jericho (visitor) would not sow less than 60lbs. per acre on his land. Mr. H. Wilke considered 35lbs. to 50lbs. sufficient on the plains, while Mr. Wooldridge considered half a bushel per acre enough.

Nantawarra, April 3.

Present—Messrs J. Nicholls (chair), J. W. Dall, H. J. Spencer, S. Sleep, E. J. Pridham, A. L. Greenshields, E. J. Herbert, R. Uppill, A. F. Herbert, T. Dixon, jun. (Hon. Sec.), and one visitor.

THIN SOWING.—In referring to previous discussion on this subject, Mr. Pridham felt sure that less seed per acre would do if it could be distributed more regularly. He suggested cross-drilling a portion of the crop as an experiment. Some he put in in this way, using the same quantity of seed, but rather more manure, gave 3 bush. per acre more than that drilled in the ordinary way.

BUNT.—Paper by Mr. C. N. Grenfell, of Mount Templeton School, on this subject was read. Mr. Dall said he drilled in a portion of a bag of clean seed and broadcasted the rest; the latter was quite clean, but the former had more bunt in it than he cared to see. He asked whether floating and skimming off the bunt balls would be beneficial. Mr. Sleep believed in this practice, and always pickled in that way. During the past two or three years his crops had more bunt than usual, but not enough to affect the sale of the wheat. The Hon. Secretary also believed in floating and skimming off the bunt balls, as the drill appeared to break up any balls and so reinfected the grain more than the seedsower did. Mr. Pridham thought floating would have a tendency to cause the skin of the bunt ball to burst; he preferred spreading on the floor and sprinkling with pickle.

Mount Bryan East, April 6.

Present—Messrs. Thos. Wilks (chair), J. Wilks, W. Brice, W. Dare, A. Pohlner, B. H. K. Dunstan, and J. Honan (Hon. Sec.).

OFFICERS.—Mr. Thos. Wilks was elected Chairman for ensuing year.

LAMBING.—A discussion took place on the best time for lambing in this district. The majority of members were of opinion that May was the most suitable month, as early feed could not be depended on, and the district was too cold for late lambs.

HORSE-BREEDING.—Members were of opinion that horse-breeding will pay farmers handsomely at present prices, and that draught horses would pay best.

Mylor, March 30.

Present—Messrs. E. J. Oinn (chair), W. H. Hughes, J. Nicholls, T. J. Mundy, P. P. Probert, F. G. Wilson, W. G. Clough (Hon. Sec.), and seven visitors.

DAIRYING.—Messrs. Hughes and Nicholls reported that the Jersey bull Prince's Lad was in good condition. Both the heifers and bull calves by him have been reared and promise to be valuable.

DRAINAGE.—Mr. T. J. Mundy asked the best way of draining a narrow gully about 2 rods wide. Members suggested a drain on both sides to take off flood waters and an underground drain down the middle if there were any springs in the gully.

FALLOWING.—Mr. Mundy asked whether fallowing would have the same effect in the hills as in the northern farming areas. Members said—Yes, where it can be done.

EXHIBITS.—Mr. Nicholls tabled saffron grown from Bureau seed, while different members tabled apples.

Tatiara, April 6.

Present—Messrs. J. Rankine (chair), A. D. Handyside, M.P., R. J. Penny, F. Smith, J. Maken, E. Prescott, E. H. W. Wiese, and T. Stanton (Hon. Sec.).

EXPERIMENTAL WHEAT-GROWING.—In reference to a proposal to try wheat-growing with the aid of fertilisers in various parts of the so-called Ninety-mile Desert members thought it was too late this season to prepare the land and satisfactorily conduct the experiment. There were settlers already established near Coonalpyn and elsewhere who could look after any plots that might be started.

ALGERIAN OATS.—Members have noted that Algerian oats get lighter in color after a few seasons of cultivation here, and they consider change of seed to be beneficial.

Bowhill, April 6.

Present—Messrs. E. Weyland (chair), N. P. Norman, C. Drogemuller, E. Drogemuller, J. McGlashan, A. Dohnt, sen., A. Dohnt, jun., J. Waters, and F. A. Groth (Hon. Sec.).

"OUR OWN INTEREST."—Mr. A. Dohnt, sen., read a paper on the above subject to the following effect:—

Farmers feel disappointed that the importers of machinery have boycotted country field trials, because some are so situated that it is only at these trials they are able to attend and make a choice of the machine that is doing the best work, and now that the Bureau Branches have been endeavoring to bring into practice the only means by which machinery can be judged in a proper manner by the field trial we are prevented from seeing an implement from which to make a choice. When the agents are asked why shows are boycotted they say that the expense of sending machinery is too great, and by avoiding the shows and trials the farmer will be able to get cheaper implements, &c. Some of the importers are giving trials on their own account in the districts where field trials have been advertised to be held by local bodies. Why be afraid of open competition? It must be far more expensive for them, as they have to bear the full cost of sending out machinery, whereas in sending out to shows concessions are always made, and at the same time they would be doing good to the district by their support, as it makes the show far more attractive and successful. For years, and even now, machines are judged as they stand on the show ground. The best-looking machine invariably gets the prize—paint and polish will go a long way to attract the eye of the judge. It does not follow that the neatest or strongest-looking machine will do the best work. We must have means of testing practically the strength and lightness of work of each implement. If the importers or makers are afraid of this test then we must be afraid of their machines. It is a common thing amongst farmers when purchasing to give preference to a cheap foreign article, when one manufactured locally of the same quality at perhaps a trifling cost above is rejected. The aim of the farmer should be to patronise as much as possible in his district, thereby keeping the money circulated in it instead of sending it away from the State. In most cases this neglect to patronise local manufactures and products is due to prejudice, which cannot find merit in an article produced near home, whilst it may be highly appreciated in adjacent districts. Again, people will buy herbs in bottles, and many other articles packed in Europe, which are or can be produced locally. Farmers buy vegetables instead of growing them, or if they try to grow them many fail because they put in plots of each sort large enough to supply a dozen families, instead of cultivating small lots and attending properly to them.

Boothby, April 9.

Present—Messrs. J. T. Whyte (chair), J. A. Foulds, W. Forbes, J. Bell, H. G. Evans, T. Sims, D. Sims, A. Rob, R. Chaplin, G. T. Way, R. M. B. Whyte, E. Bradley, R. Carn (Hon. Sec.), and two visitors.

SEASONAL REPORTS.—Mr. Foulds expressed regret that no mention had been made in the *Journal of Agriculture* of the fine rains experienced in the western district, the fall to date being about 5in. [And the Editor regrets that there is no one in the western district to supply items concerning the season and the condition of the crops, &c., for publication.—GEN. SEC.]

MANURES.—Discussion on use of fertilisers took place, Mr Foulds giving a practical address on the subject. Mr. R. M. B. Whyte reported having applied fertilisers by means of the seedsower with fair success. Mr. Sims applied from 60lbs. up to 2cwts. of Thomas phosphate per acre. The light dressing gave a return of about 2bush. per acre, but the heaviest manured gave no crop.

SEED WHEAT.—Mr. J. T. Whyte read a paper on this subject to the following effect:—

However industrious and painstaking a farmer may be in preparing his land for cropping, much of the result will depend on the variety and quality of seed sown. Every farmer knows that to get a clean crop he must sow clean seed, and that if "smutty" or dirty seed is sown the crop will be dirty. It was a great mistake to sow "smutty" seed, as, however carefully it is pickled there is considerable risk of the crop being affected. Once you get bunt in the land it is not easy to entirely get rid of it, as the stripper always leaves some grain on the ground as well as bunt balls and spores. He was strongly of opinion that plump seed should be used, though he had seen good results obtained from shrivelled seed wheat under favorable conditions. There would naturally be more food for the young plant in a plump seed than in a small grain, and should dry weather set in soon after the plant has germinated that from the small seed is naturally likely to suffer most, and once a plant is checked it takes a long time to recover. Another important matter is the selection of varieties. His own experience was that, taken all round, Steinwedel had given the best returns. Sometimes a patch of other wheat will beat it, but not in any quantity. He strongly believed in early varieties, as the later kinds do not succeed in this locality oftener than once in five years.

In reply to question as to best wheat to sow in poor land the Chairman advised Ward's Prolific. Mr. Bell reported Petatz Surprise was a good yielder and weighed well. Mr. Sims found Early Para a good wheat. Mr. Foulds advocated Steinwedel as equal to any other with manure. A discussion on bunt also took place. Mr. Foulds asked how it was that half the head of wheat was sometimes affected and the other half contained sound grain. Mr. Way asked if it was better to break the bunt balls when pickling. The Chairman thought not, but other members said yes.

MELONS NOT FRUITING.—Mr. Chaplin asked reason why pic melons drop off soon after flowering. Mr. Foulds thought lack of moisture the cause. [Probably the fruit has not been properly fertilised—a frequent cause of the trouble complained of.—GEN. SEC.]

Forest Range, April 4.

Present—Messrs. J. Rowley (chair), O. Kumnick, A. Brockhoff, W. Cherryman, J. Green, J. C. Jennings, C. Norton, A. S. Gunning, and J. Caldwell (Hon. Sec.).

HON. SECRETARY.—Mr. Caldwell tendered his resignation as Hon. Secretary, but agreed to carry out the duties until new officer is appointed.

CODLIN MOTH.—Some discussion on this subject took place. Mr. Kumnick did not think the caterpillars so numerous as they had been. Mr. Green found very few in his apples when storing them. Some of the members thought it would be a mistake to remove the restrictions on the sale of codlin moth infested apples as it would result in lowering the price of good apples and in damage to the export trade.

Wilmington, April 1.

Present—Messrs. J. Hutchens (chair), J. Hannagan, F. Bauer, J. Zimmermann, T. Carter, J. Lauterbach, H. Noll, W. Slec, J. McLeod, T. H. Harris, and R. G. S. Payne (Hon. Sec.).

SEED WHEAT FUND.—It was decided to sell the seed wheat collected by this Branch, 151 bags in all, in aid of those farmers who lost their crops last year, and remit the money to the central committee. Much regret was expressed that the central committee had not complied with the request of the Branch that they should name a district to which the wheat should be sent, as it was specially selected for seed wheat.

FARMING UNDER IMPROVED METHODS.—The Hon. Secretary read a paper to the following effect :—

Farming is not what it used to be in this State, but it is to be hoped that progress will be made continuously, so that people shall do better than to merely subsist upon the land, and will maintain an honorable and comfortable life. To merely own a block of land with implements and stock is not sufficient, but tact, thought, judgment, and energy, as well as an active observation of the improvements effected by men of a scientific training. They must be imbued with a strict desire to excel in their work—to be above mediocrity. Too many people look upon farmers as ignorant drudges, capable only of occupying a secondary position; but this opinion is entirely unjustifiable, and the farmer can show by his successful practice that he is the equal of most of the professors, merchants, artisans, or tradesmen. He must adopt a vigorous system in his work, with no slovenliness, but everything must be done well, and success will follow. He must do more than grow wheat; and the fattening of cattle, use of milking cows, breeding of pigs and poultry, and keeping of some sheep must be part of his work. A good vegetable and fruit garden must be established if possible; and the land must be properly divided into paddocks for various purposes. The barns and outhouses should be as perfect and commodious as they can be made, and all fences must be good. Fertilisers must be used, and change of seed, of stud animals, &c., must be procured from time to time. Care of machinery, implements, and everything else must be maintained, since early attention to these matters will make them last in good serviceable condition for a longer time and tend to economy. Keep the fields clean and in the best condition possible; secure the latest and best implements, and take the greatest care of them; provide perfect shelter for implements, stock, &c.; and always maintain a good supply of fodder for the live stock. All this cannot be secured in one year, but by establishing an ideal and always working for it a great advance will be ultimately attained.

Members agreed with sentiments expressed in the paper, but the Chairman did not think it would pay farmers to breed an expensive class of horses for farm work. The general opinion of members was that the best horses were not in the end more expensive than the ordinary animal, and that, if bred for sale, they would certainly bring the better price.

Holder, April 6.

Present—Messrs. J. Rowe (chair), W. Wood, J. Green, H. Perry, E. Jaeschke, H. Vaughan, H. Blizzard, Jno. J. Odgers (Hon. Sec.), and one visitor.

LARGE WATERMELON.—Mr. Green tabled a black Spanish watermelon, of good flavor, rather too sweet, weighing 45lbs.

OFFICERS.—Retiring officers were thanked, and Messrs. Rowe and J. Odgers were elected Chairman and Hon. Secretary respectively.

EXPERIMENTAL WORK.—Mr. Jno. J. Odgers read the paper respecting his experimental work at Holder Public School, of which the following is the substance :—

Introductory.—The experimental work in connection with the Holder school was done under the same conditions as prevail in the surrounding district, as it was recognised that such was necessary in order to make the results of any value. Records were kept of all work done.

Rainfall.—The season was very poor as regards rainfall. During the year 84in. were recorded; but it was extended over sixty-eight days, and at no time was there a soaking rain. The heaviest fall was only 4in., and this took place on December 3, when all the plots were

harvested. Before planting only ninety-six points were registered. A record was kept of the rain that fell during growth, and the highest was 6 $\frac{1}{2}$ in. on plots 1 and 9, whilst the lowest was 3 $\frac{1}{2}$ in. on plot No. 16.

Planting.—Each plot planted contained 20 sq. yds. The ground was prepared during February and March, and the first planting was done on March 27, the seed being put in in drills, $\frac{1}{2}$ bush. per acre being the basis of planting adopted from which to calculate experiments. None of the wheat was pickled. When harvested no bunt was found except a very slight trace in the Inglis Battlefield sample.

Manures.—*Kainit.*—This was tried with Californian Purple Straw, an application of 3 $\frac{1}{2}$ cwts. per acre being added. It gave a yield of 9 $\frac{1}{2}$ bush. per acre. This was a loss of $\frac{1}{2}$ bush. on the unmanured sample. *Sulphate of Ammonia.*—This was tried with Rattling Jack, an application of 2 $\frac{1}{2}$ cwts. per acre being made. This yielded 6 $\frac{1}{2}$ bush. per acre, or 3 $\frac{1}{2}$ bush. per acre less than the unmanured plot. *Stable Manure.*—This was tried with Leak's Improved Rust-proof, an application of 3 $\frac{1}{2}$ cwts. being added, returning a yield of 4 $\frac{1}{2}$ bush. per acre. This was 3bush. less per acre than the unmanured plot. *Kainit and Sulphate of Ammonia.*—This was tried with Inglis Battlefield, 2 $\frac{1}{2}$ cwts. being added in proportions of three to one. This yielded 7 $\frac{1}{2}$ bush., or 2 $\frac{1}{2}$ bush. per acre less than the unmanured plot. *Superphosphate.*—This was tried with Thomas Rust-proof, but it was not planted till June 22, and was a complete failure. It only received 3 $\frac{1}{2}$ in. of rain during growth. In these plots manures were a failure; but a cause may be found through drilling manure with the seed, thereby interfering with its germination. In order to test this I intend manuring at other times during the coming season.

Thick and Thin Sowing.—In this experiment $\frac{1}{2}$ bush. per acre was planted as a basis for calculation. In the record where the value is calculated wheat is assumed to be at 2s. 6d. a bushel.

Variety Sown.	Quantity Sown.	Yield per Acre.	Seed Gain on Outlay.	Cost Seed per Acre.	Return per Acre.	Excess Return over Co-t.
	Bushel.	Bushels.	Times.	s. d.	s. d.	s. d.
Californian Purple Straw .. {	3 $\frac{1}{2}$	9 $\frac{1}{2}$	13	1 9 $\frac{1}{2}$	24 4 $\frac{1}{2}$	22 7
	9 $\frac{1}{2}$	9 $\frac{1}{2}$	37	0 7 $\frac{1}{2}$	23 1 $\frac{1}{2}$	22 6
Rattling Jack {	10	13 $\frac{1}{2}$	13 $\frac{1}{2}$	1 9 $\frac{1}{2}$	25 0	23 2 $\frac{1}{2}$
	8 $\frac{1}{2}$	17 $\frac{1}{2}$	12 $\frac{1}{2}$	1 3	21 10 $\frac{1}{2}$	20 7 $\frac{1}{2}$
Inglis Battlefield {	9 $\frac{1}{2}$	9 $\frac{1}{2}$	12 $\frac{1}{2}$	1 9 $\frac{1}{2}$	23 9	21 11 $\frac{1}{2}$
	17 $\frac{1}{2}$	17 $\frac{1}{2}$	2 6	43 1 $\frac{1}{2}$	40 9 $\frac{1}{2}$	40 9 $\frac{1}{2}$
Leak's Improved Rust-proof {	7 $\frac{1}{2}$	10	1 9 $\frac{1}{2}$	18 9	16 11 $\frac{1}{2}$	16 11 $\frac{1}{2}$
	1 $\frac{1}{2}$	7	4 $\frac{1}{2}$	3 9	17 6	13 9

From this we see that the smaller the quantity of seed planted the greater the percentage returned; but on looking at the cash return the deduction seems to be that the greater the quantity of seed planted up to 1bush. the larger the cash return. In above no allowance has been made for the slight extra cost of putting in increased quantity of seed.

Test of Varieties.

Kind of Wheat.	Quantity Planted.	Yield per Acre.	Remarks.
	Bushel.	Bushels.	
Californian Purple Straw	3 $\frac{1}{2}$	9 $\frac{1}{2}$	Bearded wheat, plump grain.
Rattling Jack	10	13 $\frac{1}{2}$	Plump grain.
Leak's Improved Rust-proof	9 $\frac{1}{2}$	7 $\frac{1}{2}$	Small grain.
Inglis Battlefield	17 $\frac{1}{2}$	9 $\frac{1}{2}$	—
Medeah	7 $\frac{1}{2}$	14 $\frac{1}{2}$	Bearded wheat, solid straw, grain rather pinched.
Thomas Rust-proof	1 $\frac{1}{2}$	12 $\frac{1}{2}$	—

Irrigation.—This virtually lost all value as a test, owing to cattle destroying considerable part of crop just as it was out in ear. The yield, however, was 18bush. of fine plump grain, as compared with 12 $\frac{1}{2}$ bush. without irrigation.

Parrots.—Great trouble was experienced with the parrots, which destroyed parts of several plots. They showed great partiality for the White Essex plot, perhaps owing to its position. As this had only been planted for seed, it was left till last as a protection for the rest with a result that it was virtually all destroyed.

Several members thought manures were not suited for dry seasons, that early sowing is best; and some consider that seed should be drilled or ploughed in. [If nitrogenous manures are applied, the dressing should be light, or would be better applied more heavily for a hay crop. Bonedust or superphosphate may profitably be applied up to 2cwts. per acre, even in a dry locality. Heavy dressings of kainit or other potassic manures cannot be recommended for cereal crops.—GEN. SEC.]

Cherry Gardens, April 9.

Present—Messrs. C. Lewis (chair), J. Lewis, T. Jacobs, G. Hicks, H. Strange, W. B. Burpee, H. L. Broadbent, C. Ricks (Hon. Sec.), and one visitor.

SPARROW DESTRUCTION.—Members directed attention to mistake in report of previous meeting in stating the Branch offered prizes for largest number of sparrows' eggs and heads brought in each month. Owing to their knowledge that the eggs of many of our most useful birds are collected and sold as sparrows' eggs the members have set themselves against the practice of purchasing eggs, and only offer prizes for heads of sparrows. The Branch has also been responsible for inducing the local council to discontinue paying for sparrows' eggs.

Port Pirie, April 6.

Present—Messrs. W. Smith (chair), G. M. Wright, T. Johns, G. Hannan, H. B. Welch, J. Lawrie, T. Jose, and T. A. Wilson (Hon. Sec.).

EXHIBITS.—By Mr. Johns—Samples of Silver King, Ranjit, Majestic, and Long Tom wheats. By Mr. Jose—Samples of the first four above wheats. By Mr. G. M. Wright—Samples of three varieties of tomatoes; names lost.

CODLIN MOTH.—Inspector of Fruit to be requested to devote particular attention to fruit offered for sale in shops and by auction.

EXPERIMENTS.—Mr. Johns corrected report of his statement *re* Dart's Imperial wheat. He sowed 6bush. on ten acres for fifty-two bags wheat, and 2bush. on three acres for 6 tons of hay. He sowed 40lbs. seed per acre, which he considered quite sufficient for any sort. He pickled all his seed, except Baroota Wonder, last year. The seed first sowed gave a crop free from bunt, but some sown a fortnight later had a little in it, also a little on Early Show. He used 3ozs. bluestone to 4bush. seed, as follows:—Dissolve 2lbs. bluestone in 3galls. water. Place two bags seed on the floor, sprinkle it with 4galls. of the pickle, turn the grain over quickly to get every grain wet, then bag it. The 8galls. of liquid would suffice for 16bush. of seed (four bags). Majority of members consider $\frac{1}{2}$ lb. of bluestone sufficient to pickle a bag of seed; if stronger it would injure the germ. Mr. Lawrie said all his crops were thin, owing probably to use of too strong pickle. They did not braird well. He sowed Budd's, Allora, Early Para, King's Early, Gluyas, and Baroota Wonder in the order named. Budd's gave the best result—10bush. per acre. The paddock had been out of cultivation three years, was freshly ploughed, and turned up very rough. The seed came up badly, so he rolled it with heavy roller quickly run, with much benefit. Allora is a pretty wheat, and early, though rather liable to go down. Early Para was next in merit, though liable to shake out and go down, especially as his place is liable to gully winds. Gluyas was a good variety. King's Early did not do well, and Baroota Wonder failed. Mr. Welch considered it a mistake to grow Early Para and Gluyas where strong winds prevail.

BLACK RUST.—It was shown that black rust (*Urocystis oculata*) differs from bunt (*Tilletia caries*) and smut (*Ustilago segetum*). Black rust spores attack the stem, leaves, and chaff; bunt attacks the grain; and smut attacks the chaff and grain. [The spores of black rust most probably lie on the field and wait for the cereal plant to start; bunt spores exist amongst the seed wheat grains, and are sown along with the seed—hence the necessity for pickling.—GEN. SEC.] Members agreed that early dry sowing of seed favored the development of black rust, and believed that some varieties are more subject to it than are others. Marshall's Hybrid and Silver King were sown side by side on the same day. Marshall's Hybrid had 75 per cent. of black rust, and Silver King not more than 10 per cent.

Onetree Hill, March 29.

Present—Messrs. J. Bowman (chair), F. Bowman, G. Bowman, J. Flower, J. Hogarth, F. L. Ifould, M. G. Smith, and J. Lucas (Hon. Sec.).

FEEDING SHEEP.—Mr. Flower read the following paper on this subject:—

I think it would pay to feed sheep on hay chaff in times when hay is plentiful rather than let them go low in condition through scarcity of feed. After harvest sheep generally go back, as dry grass will not keep them up. Good wheat stubble has been proved to be a valuable fodder, but it does not last long. If the farmer can contrive to keep his sheep in good condition through this annual crisis he will be in a position to take advantage of the earliest favorable market instead of being compelled to part with them at a serious disadvantage. I have kept sheep for a long time, and I find that the trouble is to keep them fat at this time of the year. When I first experimented with supplementing their feed with hay I had 300 sheep, and turned them into a paddock where there was a haystack. When the paddock was fresh they did not take to the stack, but in a few days they did so, and thrived well. I soon found, however, that the waste through much being trodden under foot was so excessive that I decided to substitute chaff for hay. I had a trough placed near to where the flock watered, filling it at night with chaff, and in the morning it was cleaned out as if it had been swept. After this I bought boards and made half a dozen troughs so that I could feed out about 150 lbs. at a time, keeping the sheep away from the haystack. This was in January. At present I am feeding 700 sheep, which I am keeping fit for market. At the end of November last I bought 300 sheep in very low condition. All the land they had to run upon was two paddocks of hay stubble of 100 acres each, and 90 per cent. of them were fat. Feeding should not be intermittent. My sheep are as regularly attended to in this respect as are my horses, the allowance per head being 1 lb. of hay and chaff daily. I should use chaff only, to prevent waste, had I feeders enough. Besides what is trodden under foot, the coarse ends of the hay are uneaten, and on this account the hay should be as green and fine as can be procured. I distribute the hay around the chaff troughs, and the sheep feed on either indiscriminately. Given as much as they will eat, sheep will fatten as quickly upon chaff as upon green grass. The difference in condition becomes perceptible after two or three days' extra feeding. When I had only fairly good feed I gave my sheep $\frac{1}{2}$ lb. each day per head, increasing the allowance to 1 lb. as the feed in the paddock became scarcer. With hay at £1 per ton in stack—the present price—it would pay to feed sheep with, say 1 lb. a head daily. By this reckoning the cost per head for four months' keep would be 1s. 3d. When in January last I commenced feeding with chaff, I constructed my troughs V-shaped with two boards, but I found, subsequently, that putting them together on the square with three boards was more economical, more effectually preventing waste, and giving one-third more capacity for the same quantity of timber. Boards, 12 in. wide and 1 in. thick, of white pine will make serviceable troughs. One hundred feet of timber will suffice for four troughs 8 ft. long, the ends of which can be supplied from such scraps—old binders, drill cases, &c.—as can always be found about a homestead. Boards can be bought in Adelaide at a cost of 18s. 6d. per 100 ft., so that three board troughs will cost at the rate of under 7d. per lineal foot. Five 8 ft. troughs will be required for each 100 sheep. In the absence or insufficiency of early rain it would, I think, pay a farmer who has, say, 300 ewes lambing in April to feed them on chaffed hay to keep the lambs going now that the latter bring such a good price. At first there may be some difficulty in familiarising your sheep with this new method of feeding; but if you round them up, and the troughs are placed close to the water or camping ground, the difficulty will soon be overcome, and they will follow you to the feeding-place whenever you take their feed out.

An interesting discussion ensued, Mr. Flower's departure in sheep-feeding being new and somewhat startling to members. With the first appearance of

green feed they were aware that sheep lost their zest for dry feed, but there was no doubt that with the scarcity of green grass neither hay nor chaff would be neglected. Members considered Mr. Flower's contention, based as it was on personal and successful tests, was entitled to the serious attention of farmers. In wet weather in particular the waste of hay would be a drawback, but with chaff-fed as proposed this would not apply. One member is already making preparations to benefit from Mr. Flower's experience, and others will probably follow in the same line. Members calculated that going by Mr. Flower's figures a flock of 700 sheep each receiving 1lb. of chaff per day would in four months' time show a minimum profit of £100, taking hay at its present figure. Mr. Flower did not think that a sheep would eat more than 1½lbs. of chaff per day if it could get all it wanted.

Golden Grove, April 6.

Present—Messrs. J. R. Smart (chair), A. Harper, J. Ross, W. Mountstephen, J. Woodhead, T. G. McPharlin, R. Smith, F. Buder, S. A. Milne, and J. R. Coles (Hon. Sec.).

CODLIN MOTH.—Mr. Harper has found bandaging the trees fairly effective in reducing the later broods of caterpillars if the work is well attended to. Has tried poultry in the orchard, but they seem to do no good. Where the branches are spreading he thinks it would be a good plan to drive stakes in and bandage them also. Thinks his orchard has fewer moths than before. Mr. Buder said codlin moth being nocturnal makes it more difficult to deal with. An uncultivated orchard suffers less from codlin moth, but the fruit is inferior. Probably ants and other insects destroy the caterpillars. He bandages, and is most careful in picking off and gathering up the first infested fruit, whereby the possibility of second and third broods is considerably diminished.

EXHIBITS.—Mr. Buder tabled American Golden Russet apples, rather small, soft, and of splendid flavor; a good bearer. Mr. R. Smith tabled Red-Wetherfield onions grown from Central Bureau seed, 6in. diameter, strong flavor, not a good keeper; also Webster onions, average size of a cricket ball, very good.

Maitland, March 2.

Present—Messrs. H. R. Wundersitz (chair), T. Bowman, H. Bawden, C. F. G. Heinrich, W. Wilson, J. Hill, J. Kelly, W. Bowey, E. W. Moody, A. Jarrett, and Dr. Nicholls (Hon. Sec.).

PICKLING SEED WHEAT WITH LIME.—Mr. John Hill read the following paper:—

For the information of our Bureau, I give the following method of pickling seed wheat with lime for the prevention of bunt:—Have ready a copper of boiling water; take two kerosine tin buckets, put a large shovelful of good fresh lime in one, half fill with the boiling water to slack the lime. When slacked fill with hot water, stir, and pour off into the second bucket, leaving sand and stones in bottom of first bucket. Then have a bag of wheat emptied on a clean hard floor, pour on the liquid while hot, mix well with shovels, and put in tied bags or corner of barn over night, when it will be ready for sowing with a broadcast machine. The seed may be sown in dry weather, and there will be no danger of the wheat malting. I have used lime over forty years, with better results than from bluestone. Lime enhances germination, bluestone retards it.

Mr. Bowey said the drill had come to stay, and the wheat must be pickled so that it will pass through the drills. Seed pickled with lime would not pass. Bluestone is injurious to the plant. The great secret is to have the drill clean and the seed clean. Chairman said bunt laid in the ground for a very

lengthened period. [Is there any *proof* of this?—GEN. SEC.] He washed his seed and skimmed off the floating bunt-balls. Mr. Bowman allows his seed to get dead ripe before reaping. By the use of best bluestone and clean seed there would be but little bunt. Mr. Heinrich would allow the wheat to bleach, as he noted that self-sown crops never have bunt. Mr. Bawden would bleach it on the floor, and, if necessary, water it. Mr. Kelly's father had pickled with lime and a handful of salt, and never had bunt. It was finally decided to experiment with bleaching, pickling with lime, and with lye.

HOMESTEAD MEETING.—This meeting took place at the home of the Chairman, and the members walked over the farm, orchard, and garden, and enjoyed the hospitality of the host and hostess.

Murray Bridge, April 10.

Present—Messrs. B. F. E. Jaensch (chair), R. Edwards, F. G. Jaensch, W. Schubert, G. A. Kutzer, W. Wundersitz, and W. Lehmann (Hon. Sec.).

EXPERIMENTS.—With regard to a suggestion that experimental plots should be tried in various parts of the so-called "Ninety-Mile Desert," with the aid of phosphatic and other manures, members thought that the season was altogether too far advanced at present, but that persons already settled there might be induced to conduct experiments on land already cleared, fenced, and prepared for sowing with cereals.

Mount Remarkable, April 4.

Present—Messrs. C. E. Jorgensen (chair), H. N. Grant, J. B. Morrell, G. Yates, W. Lange, T. P. Yates, H. Humphries, T. S. Bishop, J. O'Connell, T. S. Casley (Hon. Sec.), and one visitor.

OFFICERS.—Mr. Casley was thanked for his past valued services, and Mr. J. O'Connell was appointed Hon. Secretary.

ENSILAGE.—Mr. Casley showed ensilage four years old in splendid condition. His cows ate it greedily, and the milk and cream were much improved in quantity and quality. He will read a paper on "How to Prepare a Silo" later.

Maitland, April 6.

Present—Messrs. A. Jarrett (chair), J. Kelly, O. Treasure, J. Hill, W. Bowey, Dr. Nicholls (Hon. Sec.), and several visitors.

MANURING.—Mr. W. Bowey read the following paper:—

Now that the use of the drill with artificial manure has established itself amongst us, one of the most important questions that can engage our attention is the judicious use of manures. Therefore we want to consider, first, the best kind of manure to use; second, the best quantities to use; third, the best way of using same to obtain best results with less injury to our land. Here let me say that as land in our district is of such a variable character, even to such an extent that almost adjoining sections require different treatment, that it behoves every farmer to have experimental blocks for himself, which would no doubt enable him to more successfully deal with his land under advanced cultivation. To refer to my points. First: The best kinds of manure to use. I believe that superphosphate of lime is the manure most profitable for the conditions of our land. I am very partial to Ohlendorff's, and have always had good results from it. It certainly is very sticky and difficult to use alone; but I would rather put up with mixing it with sand or wood refuse than complain, as I fear by the farmers making so much complaint about sticky manures we shall get a dryer but inferior article manufactured. I believe we shall have to be guided by a rotation of manures, or otherwise we shall impoverish our land; therefore I think a manure lighter in ingredient, with increased quantity, should be used every alternate time of cropping for at least three times. Second: The best quantities to use. Here I do not agree with Prof. Lowrie, who is always advising the use of an increased quantity of manure; for I contend that we are not assisting

but forcing nature, and therefore it is possible to force nature until she refuses to yield at all. I consider a moderate use of manure far safer—say, from 70lbs. to 100lbs. per acre, according to quality and strength. For after all I firmly believe the success of a crop depends very largely upon what kind of start it gets at first, and I believe the secret of advantage by using manures is that it assists the young plant at the start, and enables it to become firmly rooted. The same applies to animal life. A thing starved at first never develops into proficiency; also a thing over fed will never develop as it would under judicious management. Therefore we must find out the happy medium and strike at it, and not aim at big things one year at the risk of impoverishing our land. Third: Best way of using manure to obtain best results with less injury to our land. Here we come to the matter of rotation or mixing of manure; and let me say here that I deprecate sowing in dry weather or before the season has properly broken up, but as soon as that takes place the earlier our seed (in reason) is put in the better for both. There are a number of farmers now who mix their manure with sand or refuse early in the year. I would like to be certain if there was any risk of some of the ingredients escaping, or would it be beneficial in forming a compound of that mixed with it. I am inclined to think myself that some of the acids would escape. I have always mixed over night and found it to answer well, and like refuse from old woodheaps the best. I believe the mixing of manures to be good in some cases, but it needs to be done with care and discretion. Last year I sowed a seventy-acre paddock under three different processes, each containing 100lbs. manure: First, Lawe's mixed with sand, return, 18bush. per acre; second, equal quantities Lawe's and super. guano, result, 20bush. per acre; third, all super. guano, result, 23bush. per acre. Now, I believe the results were mainly due to the fact that the paddock had for the previous crop been drilled with all Lawe's manure. I am fully convinced that change of manure and change of crops will do more to retain the producing qualities of our land than anything else, and I do say, fellow farmers, experiment for yourself, and not listen to what others may tell you. A practical experience is what we need. I have also used artificial manures very successfully with fruit trees; the growth in one year you would never credit unless you saw for yourself, the trees having put out shoots between 4ft. and 5ft. But judgment must be exercised in using it so as not to injure the trees.

Mr. Bowey added that he left some of his fruit trees unmanured, and he noted a very marked difference in favor of the manured. Even those which were not cut back, but manured, showed a decided benefit. The Hon. Secretary urged members to try heavier dressings of super., &c., but this did not meet with general approval. Mr. Treasure and Mr. Bowey had tried it, but did not find any advantage in the crop of hay. Mr. Hill thought experiments should be tried, but others said it was not worth the trouble, because in this part it was possible to avoid cropping the same land consecutively. [If the *quality* of the hay grown with phosphatic manure had been tested there would have been found a difference in its favor as against non-manured hay; but if *quantity* of hay were required, some nitrogenous fertiliser should also have been applied.—GEN. SEC.]

HOMESTEAD MEETING.—This meeting was held at Mr. J. Kelly's homestead. Members were much interested in the horse stock, and in a reservoir being excavated to a depth of 12ft 6in., the horses walking in a circle on the top and working the plough with chains. The usual hospitality was extended to the members, their wives and friends, by Mr. and Mrs. Kelly.

Mount Pleasant, April 15.

Present—Messrs. G. Phillis (chair), W. M. Vigar, W. Lyddon, P. Miller, jun., H. Drogemuller, J. A. Naismith, R. Godfree, and H. A. Giles (Hon. Sec.).

BUSH FIRES.—Mr. J. A. Dodgson, of Eden Valley, wrote suggesting that bush fires could be arrested by selecting roads running north and south and east and west, and thoroughly clearing off all combustible matter and feed upon them. These breaks would serve as bases for action against any fire that might break out. After a long discussion it was decided to bring the matter before the ratepayers at their annual meeting.

LIVE STOCK.—Many cattle and sheep are dying, probably through too much dry feed.

Meadows, April 1.

Present—Messrs. W. Pearson (chair), W. J. Stone, F. W. Dohnt, F. W. Vickery, T. A. Buttery, G. Ellis, D. D. Murphy (Hon. Sec.), and two visitors.

BUSH FIRES.—Mr. Pearson suggested that a garden rake, a spade, and an axe should be part of the equipment of persons going to put out a bush fire. He never went without a rake. Three men with rakes could clear a patch and burn a break against a fire more quickly than twenty men without rakes.

CODLIN MOTH.—It was shown that if a man were fined £5 for selling "wormy" fruit he would lose the profits on 200 cases at present prices—about 1s. 6d. per case. It would appear that no sure remedy could be adopted for prevention of codlin moth. If pigs were turned into the orchard they would eat all the apples that fall. It was decided that, "Seeing there is no sure method of preventing the spread of codlin moth, this Branch is of the opinion that the penal clauses in the Vine, Fruit, and Vegetable Protection Act should be rescinded." [There *are* sure and certain methods of keeping the damages done by codlin moth within close limits. By the adoption of spraying, bandaging, gathering and treatment of infected fruit, costing not more than 1s. per tree in the United States, the growers save 95 per cent. of sound fruit, and also decrease the infestation year by year. One most effectual preventive of the spread of the pest is found in stopping the removal of infected fruit from place to place.—GEN. SEC.]

Kanmantoo, April 7.

Present—Messrs. Thos Hair (chair), J. Downing, E. Downing, J. Mullins, T. Hawthorne, P. Lewis, J. Hair, F. Lehmann (Hon. Sec.), and one visitor.

BEST WHEAT FOR FLOUR.—The Hon. Secretary read a paper to the following effect:—

It has often been stated of late that imported flour made from Manitoba wheat brings up to £2 more than that made from Australian wheat. This Manitoba grain has two or three casings, or bran, the outer being fibrous and indigestible. Just under these casings are the gluten cells, which are darker in color than the starch cells filling up the centre. The American miller removes only the outer bran, and all the rest is ground into flour; thereby all the gluten is saved, and that is the most nutritious part. Such flour requires machinery different from that used here, and it is patented. The flour made in Australia is too starchy; the gluten is left in the pollard, and much nutriment is also left in the bran. Our fine white flour makes nice-looking white bread; but it has not sufficient strength to nourish the nerves and teeth, and this is the cause of their weakness and decay. Is it the fault of our wheat or of the miller that Manitoba flour commands a higher price than that of South Australia?

Members thought it would be well if some scientific men would inquire into question whether fine white flour is the cause of mal-nutrition of nerves and teeth.

BEST WHEAT.—The Chairman considered Early Para the best wheat to grow for hay, it being tall, heavy, and early enough to cut with oats. The Hon. Secretary prefers White Tuscan on clean land for first part of hay crop, Dart's Imperial next, Purple Straw and King's early to follow.

Koolunga, April 4.

Present—Messrs. T. B. Butcher (chair), J. Button, R. Lawry, J. Pengilly, J. Butterfield, G. Cooper, W. T. Cooper, W. J. Jose, E. J. Shipway, J. C. Noack (Hon. Sec.), and three visitors.

WHEAT EXPERIMENTS.—Mr. Pengilly tabled samples of wheat grown from Central Bureau seeds. Ranjit was uneven in growth, weak straw, ripened

too quickly, and the grain was shrivelled. Half a pound of seed yielded 15lbs. wheat. Silver King yielded about the same return, but the sample was better. Majestic yielded 10lbs. of a moderate sample from $\frac{1}{2}$ lb. of seed. Mr. Jose also tabled samples, and spoke very highly of Ranjit, which yielded at rate of 18bush. per acre. The opinion was expressed that these wheats were scarcely suitable for the North, but were worthy of further trial, as the season was not altogether favorable to a fair test.

PICKLING SEED WHEAT.—Discussion on this subject was continued from last meeting, several members giving their experiences on the treatment for bunt.

FERTILISERS.—The fact that Professor Lowrie continues to advocate heavier dressings of fertilisers than are generally used was referred to, and members were of opinion that it would pay farmers to test the matter for themselves.

Appila-Yarrowie, March 29.

Present.—Messrs. P. Lawson (chair), J. Daly, W. C. Francis, J. H. Bottrall, A. Fox, J. H. Klemm, E. Catford, R. H. Grant, N. Hannagan, W. Stacy, J. C. W. Keller, and C. G. F. Bauer (Hon. Sec.).

WHEAT EXPERIMENTS.—The Chairman tabled fairly well-grown samples of wheat from Bureau seed, one of which was, however, very much mixed. He did not consider any of the varieties suitable for this locality. The Hon. Secretary said his wheats grew well for a time, but the hot winds completely destroyed them. Unfortunately the results of his work of several years' experiments were also lost, there not being a sound grain left in the whole of his plots. Some of the varieties he was working on he had, by years of selection, got as much as eight grains in a row round the heads, while the heads were of large size.

Yorke town, April 13.

Present.—Messrs. J. Koth (chair), A. Jung, C. Domaschensz, S. Vanstone, B. Lloyd, C. H. Davey, and John Davey (Hon. Sec.).

IMPACTION.—Mr. Jung said that the following cure for impaction of the omasum has been successfully adopted in parts of Victoria, as well as in several instances near Yorketown:—Mix two tablespoonfuls each of common gunpowder, whiting, and sulphur dissolved in vinegar; divide into two doses, and administer. Two doses will cure.

Gumeracha, April 17.

Present.—Messrs. D. Hanna (chair), W. A. Lee, A. E. Lee, J. C. Gall, W. V. Bond, Dr. J. R. Stephens, and T. W. Martin (Hon. Sec.).

RABBITS.—Mr. J. C. Gall read a paper on this subject, to the following effect:—

Of all the numerous imported pests inflicting serious injury upon producers probably the rabbit exceeds the whole in the amount of damage inflicted. Almost fabulous sums of money have been spent by the various Governments and by private individuals in the effort to mitigate the evil, but the money spent is probably not a tithe of the losses through their depredations on pastures and cultivated lands. Immense areas of land that were once covered with sheep and cattle are now waste and abandoned through the advent thereon of rabbits. Where the land is moderately populated it is not very difficult to keep the rabbits in check, but where large areas, capable of being only lightly stocked at the best of times, the difficulty of exterminating hordes of rabbits is almost insuperable. The areas must necessarily be

large, if taken up at all, and when there happens to be a good season, with fair feed, the rabbits will increase so rapidly and enormously that it is likely that they will destroy every plant, shrub, and tree, and convert the whole interior of the continent into a veritable desert. The difficulty of fighting the pest on land which was once stocked with sixty to eighty sheep to the square mile is now so great that few people of experience with sufficient capital would care to undertake it. Notwithstanding the countless myriads of rabbits that are annually destroyed by poison, and many other methods, the pest continues to multiply and to spread. Not only the pastoral country is affected, but the rabbits are becoming numerous in the thickly-settled districts, and Gumeracha and the hilly country adjacent has more than its share, whereby the grazing capacity of the land has been considerably diminished. Some steps must be taken to deal with them. Rabbit-proof fencing is the best defence in these localities, though in the pastoral areas it is to some extent a failure owing to floods, drift sands, cost of supervision and maintenance over long lines of rough country. Poison cannot be so effective in a locality like this, where green herbage exists always along the beds of watercourses, &c., and where there is plenty of dry feed. During an experience of twenty to twenty-five years he had never known of really satisfactory results from poison, except where the land was first securely fenced. The proportion of rabbits killed was small in comparison with those left alive, and the cost of distribution so large that he doubted if the benefit derived balanced the cost. Then the relief was only temporary, and the cleared area soon becomes re-infested when efforts to keep them down are relaxed. This will always be the case until wire netting is generally used as a first line of defence. This locality is particularly difficult to work with poison because it is surrounded with rough hilly scrub; with plenty of cover and abundance of green plants, which will prevent rabbits taking poison as freely as in drier districts. Rabbits are destroying the young wattles, and the important bark industry will be the first to feel their injuries. Some people think that an ordinary wet winter will keep down the increase of rabbits, but I feel certain from past experience that they have now arrived at a stage at which only the most energetic and combined action will prevent them becoming a very serious pest, causing a heavy if not ruinous loss to our grazing and agricultural industries.

Mount Gambier, April 13.

Present—Messrs. J. Watson (chair), M. C. Wilson, T. L. Browne, A. J. Wedd, J. C. Ruwoldt, W. Barrows, W. Mitchell, J. Dyke, J. Kennedy, and E. Lewis (Hon. Sec.).

TUBERCULIN.—Mr. Mitchell submitted a number of clippings from newspapers adversely criticising the claim by scientists that tuberculin is a safe test for tuberculosis, and even going so far as to aver that tuberculin has communicated tuberculosis to cattle which were perfectly free from that disease. One writer asserted in regard to tuberculin:—"Its danger is undoubted; its fallibility has been proved; its effectiveness is doubted." Mr. Mitchell thought scientists are too ready to jump to conclusions, and are pretty often in error. [There are many people still remaining who contend that the earth is flat, and many thousands who hold that vaccination against smallpox is useless and dangerous; in fact, no discovery made by scientific men has ever been accepted without dispute and objection.—GEN. SEC.]

EXHIBITS.—Mr. Barrows tabled five samples of wheat, including four sent by Central Bureau. Allora was the best looking, and Ranjit was best of the four Central Bureau lots. His own Tuscan was better than any of the five, but he would give them all another trial to see if acclimatisation would improve them.

Penola, April 13.

Present—Messrs. E. A. Stoney (chair), L. W. Peake, H. Ricketts, W. Miller, and R. Fowler (Hon. Sec.).

BUSINESS.—Nearly the whole meeting was taken up in arranging for the Conference of South-Eastern Branches. [Which was afterwards postponed till May 1st.—GEN. SEC.]

Kapunda, April 6.

Present—Messrs. W. Flavel (chair), Pat Kerin, J. H. Pascoe, R. Shannon, W. M. Shannon, G. Teagle, J. J. O'Sullivan, B. R. Banyer, Peter Kerin, and G. Harris (Hon. Sec.).

HOW TO IMPROVE CAPACITY OF FARMS.—Mr. J. J. O'Sullivan read a paper, "How to Improve the Carrying Capacity of Farms," to the following effect:—

Through the necessity to use costly new machinery and manures, and the low prices for produce, it behoves the farmer to be discreet, careful, and observant in everything relating to farm work. Trifles may become very important items in relation to other matters of greater value. At one time it was considered that weight was essential to strength in farm implements, but it has been proved now that lightness is consistent with strength, and that more work can be done with less expenditure of power. To meet the extra cost of this improved machinery, &c., the farm must produce more abundantly, and of better character. Farmers must try to make their fallow land productive, instead of leaving it absolutely unproductive. Summer feed could be grown upon it, such as maize, sorghum, &c., for feeding stock. It is in autumn and early winter that stock lose condition, and it takes a lot of time and feed to make up that loss, but if they were provided with some green feed to supplement the dry fodder they would maintain their good condition. Sorghum and maize should be sown during September whilst there is moisture enough in the soil to start the seed, and may be sown later when rains fall. Green feed silage will be beneficial, especially to milking cows, as well as to sheep, horses, pigs. All wheat chaff should be saved and covered in a shed to serve as winter feed for stock, and if there were a large stack of straw alongside the cattle and sheep would enjoy the feed and shelter during cold winter weather. He suggested a shed 60ft. x 20ft.; rail off the centre half, leaving two ends open, and build the stack at the back and over the shed. Build up the two centre divisions with galvanized iron, leaving a space of 13in. open at the bottom so that the stock can feed comfortably on the chaff stored in the centre compartment.

Mr. Teagle said wheat chaff alone was too dry and innutritious, and gave rise to indigestion. It might be better if scalded. He had a cow die through eating wheat chaff. Mr. Pascoe said his stock ate chaff. Mr. W. M. Shannon said farmers should use the binder and the thrasher, and save the straw instead of wasting it. There was possibility of carrying ten times more stock on the land than at present. By leaving the crops to stand until dead ripe as much as 2bush. to 3bush. of grain per acre were lost through stormy weather. If their farms were made to carry more stock the land would be improved and the income increased. "Cocky" chaff and straw do not fatten stock, though it may fill them.

Millicent, April 4.

Present—Messrs. H. F. Holzgreffe (chair), B. Varcoe, H. Oberlander, J. Davidson, W. R. Foster, H. A. Stewart, R. Campbell, A. McRostie, H. Warland, and E. J. Harris (Hon. Sec.).

EXHIBITS.—By the Hon. Secretary—Samples of grapes. By Mr. H. Oberlander—Twelve sorts of apples including Cleopatra, Dunn's Seedling, and Shockley. He advised planting best kinds only, as he had sold best qualities of apples at very nearly double the prices received at same time for inferior sorts.

GRASS FIRES.—The Chairman spoke strongly against the practice of burning fern lands, as fires in this do more harm than good, and often extend to adjacent good land. Any burning for fire-breaks might be done early in summer; but some people did not care where or when they burned. In ferny country any grass that had grown was burned, whilst the ferns grew stronger. Members remember the time when grass covered the ferny hills from Mount Muirhead to Gran Gran. Mr. Varcoe said he had noticed that stinkwort will burn when it is in flower. Some members thought that this would help the next crop to grow more strongly. [How can this be? Stinkwort is an annual, and if destroyed by any means before seed is produced, how can it be strengthened next year?—GEN. SEC.]

Co-OPERATION.—Mr. R. Campbell said the importers of harvesting machinery had combined to raise and fix the prices of machinery. It was stated that mowers and binders, which cost only £8 to manufacture in America, were sold here at £55. Mr. Trenwith, M.L.A., of Victoria, says they cost £15, this, probably, being the export price. Cyanide of potassium was sold by the wholesale druggists at 3s. per pound, but the Government sold it by the pound at 1s 3d. He believed the councils paid 5s per pound for phosphorus that could be bought in London at 1s. 11d. per pound. Mr. Davidson said he understood that a certain make of separator sold at £75 in Australia is sold at £15 in the country where made. No motion was submitted on this subject, and nothing was done in the matter. [It is very easy to repeat erroneous statements, but it would be difficult to prove that such enormous differences exist between manufacturers' prices and salesmen's profits.—GEN. SEC.]

POULTRY.—Poultry do well here, and it is possible that eggs may be sold to better advantage if put down in water-glass solution when they are plentiful and cheap, and put on the market when prices are better. This had been done by large dealers, and these eggs would be placed on the market during April, May, and June, whilst eggs were comparatively scarce.

PRESERVATION OF IMPLEMENTS AND MACHINERY.—Mr. J. Davidson read the following paper:—

Implements and machinery on the farm are more subject to illusage than those in use in shop or factory, because they are exposed to weather. There are many commonplace rules with regard to the proper care of them well enough known, but which are not practised. If the exposure to the weather went no further than during the time the implements were being utilised the injurious effects of sun and rain would be greatly minimised. One does not require to explore many farm yards and paddocks to be convinced that a great amount of carelessness and neglect in this respect exists. Too often we see valuable machines and implements put away for the year in the shelter of a wire fence, or employed to fill a gap in a fence, or supplementing a dilapidated gate. In the case of iron and steel implements corrosion is the agent that works destruction, and, as a preventive, these should be treated with some kind of anti-corrosive application, such as paint, grease, or oil, as soon as they are finished with for the season, and then put away in a rain-proof shed. Now, when farmers will be bringing their ploughs into requisition, a good deal of trouble will be given for the first few days in getting the mouldboards clean, where during the year they have been allowed to corrode. Considerable time will be lost scraping off the soil, the draught will be increased at least one horse power, meaning a loss of horseflesh; anyone knows it is much harder to drag a rusty plough to which the soil adheres than one as bright as a shilling. This may be prevented by a little trouble and forethought. When the ploughing season is over the plough should be painted with ordinary oil paint, which can be easily scraped off when the plough is again wanted. Better still is an application of one part of melted tallow and one of linseed oil, this will stay corrosion. The preventives will apply to all implements having bright parts, which are not in constant use. Concerning the more intricate machinery, such as mowers, binders, seed-drills, and chaff-cutters, the bearings should be removed and cleaned before the oil coagulates; this will ensure smoother running of the bearings and reduce the friction and wear, besides giving a better appearance to the machine. Frequently sand and grit find their way into these, which cause undue wear of the brasses, and, in case of fast-motion spindles, the friction would be great. As little play room as possible should be allowed in fast-moving machinery, and nothing allowed to work in a loose state, which would cause unnecessary vibration, for upon this rests the principal wear and tear of the machine. Machines, whether of wood, or iron, or both, should be always carefully housed, the weather effects upon wood being more severe than on iron. It should be the imperative duty of every farmer to erect some kind of shelter shed for his implements and machinery. Here is a circumstance that often occurs with the negligent farmer. At the end of the season his mower has got into disrepair. The machine is put away in this condition to await the coming of another harvest. His hay may come on fast, and all is a bustle to get at it. On bringing out his mower he finds it is out of repair, and must go to a smith's before a start can be made. The smith is busy at this time, and a few days elapse before he gets the repairs executed. The consequence is the farmer sustains a loss on the value of his hay. On the other hand, the methodical farmer would have had his machine put in thorough order at the end of the previous season. If this were done in the case of all machinery and implements time and valuable crops would be saved. It is hardly to be supposed that every man on the farm can be expected to be an all-round mechanic, and be able to do any job needed; but there is one thing nearly every man can do, and it is a feature most sadly neglected on the farm. It does not require a

mechanic, much less an artist, to do a good deal of the painting called for about farm implements, and also general farm fixings and buildings. With white lead, oil, a little color, almost any handy man can make a fair job of painting ploughs, drays, wagon wheels, and other implements, and thus save pounds in a year. A little forethought would provide the materials and keep them handy for use when other work is not pressing.

Mannum, April 12.

Present—Messrs. J. G. Preiss (chair), J. W. Haby, J. A. Schulze, J. Nickels, R. P. Scott, and Hy. Brown (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. Preiss reported that Silver King and Marshall's Hybrid did not do so well with him as Steinwedel and Purple Straw. Mr. Schuetze found Ranjit earlier than Purple Straw and would like to obtain more for further trial. Mr. Preiss reported that the Hanna Barley, received very late last season, had done well, and the seed reaped should be carefully tested again.

Burra, April 12.

Present—Messrs. F. A. S. Field (chair), Joseph Flower, Eli Goodridge, A. McDonald, Hon. John Lewis, M.L.C., and R. M. Harvey (Hon. Sec.).

WOOL CLASSES.—Chairman reported that Mr. George Jeffrey had offered to conduct a class in wool-sorting if eight students would attend. There were twenty offered, and the class received twelve lessons, with fourteen fleeces to practice upon. He showed the students that wool is "classed" in order to arrive at its true value, and he showed them how to sort and class wool. He also illustrated how to get up sheep skins, so as to secure the highest value in the market. Mr. Jeffrey gave a public lecture on sheep and wool in the Institute. Mr. Jeffrey had stated that he would be classing in some of the large sheds next shearing, and would be pleased to have any students with him if they would give in their names.

"BITTER PIT" IN APPLES.—Mr. J. Flower tabled some apples covered with bright carmine spots. Some similarly affected apples had been sent to the General Secretary, who replied that Professor D. McAlpine agreed with him that the disease was "bitter pit," with brighter color than usual. It was recommended to drain the land, fertilise with phosphate, potash, and farmyard manures, and to spray just before the buds break with Bordeaux mixture, sulphate of iron, and limewash, on separate trees. One pound weight of sulphate of iron in 20galls. water would be strong enough, perhaps. The Bordeaux mixture should be winter strength.

Stockport, April 20.

Present—Messrs. J. F. Godfree (chair), J. Smith, J. Smith, jun., C. W. Smith, W. Barker, D. G. Stribling, T. Howard, G. Thomas, T. Megaw, F. Watts, and J. Murray (Hon. Sec.).

WEEDS.—Mr. G. Thomas read a paper on "Weeds, and how to get rid of them," to the following effect:—

Stinkwort.—This is very troublesome, and if the fallows have any on, it will be difficult to sow the crop. The field should be well scarified before harvest time, and then few plants will be left. If the land is manured there will not be much stinkwort; and if sheep are put on to an infested field they will eat and kill a lot of the seeds.

Cockspur.—This gives little trouble on red lands; but on black friable soils will grow strongly. Ordinary working of the land will keep it down, and sheep will help to keep it within bounds. If left to grow up with the crop it will choke the machines.

Native Cabbage.—If this is abundant in a crop it causes a great loss of grain, besides much trouble in choking it up. Farmers should be careful not to sow the seeds along with their grain or manure. This plant grows to a great size on rich black soils. If many plants are mixed in the crop, choke-cutters will be useful on the stripper.

Poppy.—Wherever this plant is seen it should be destroyed, as it is very strong and prolific in seeding. The seeds should be all winnowed out of seed wheat, &c.

Yellow Weed, Radish Weed, Blue Weed, and Ari hoke, &c., were also mentioned, with much the same recommendations. The author thought the district councils should see that the Noxious Weeds Act is put into force.

Mr. G. Smith said some people talked about weeds dying out in time; but he had known cockspur and stinkwort over forty years, and they had not yet died out. By growing hay many weeds would be got rid of. He had pulled up all poppies he could see on his fields, but next year there were more than before, and, although he continued to chop them out, they seemed to increase. Then soursops were worse than poppies, unless the places where they grow are thickly covered with straw. Members thought the best way to kill all weeds (except soursops) is to perfectly work the fallowed land. Mr. Godfree mentioned "wild mustard"—charlock (?)—as extremely difficult to exterminate. He thought the keeping of sheep would reduce weeds considerably.

Watervale, April 1.

Present—Messrs. J. Thomas (chair), H. Scovell, G. Hunter, H. Beck, H. Ashton, T. Solly, G. Holder, W. Smith, and E. Treloar (Hon. Sec.).

CURCULIO.—Mr. W. Smith tabled a number of beetles found under fruit trees. They are very numerous, and eat the leaves of olives, fruit trees, &c., and also the bark. [These are curculio beetles (*Otiorrhynchus picipes*). They are more fond of leaves of olives than of other plants. Dissolve 1oz. of arsenic with 1oz. soda in 1 pint of water, add this to 3galls. water, dip olive twigs in it, and stick them in the ground near the stems of the attacked trees. If this cannot be done put in a number of hens, dig around the trees, and scatter some grain there. The fowls will scratch up beetles and grain, and eat both. Bandages around the stems, with the loose ends upward, will trap a good many, which need to be destroyed daily.—GEN. SEC.]

CODLIN MOTHS.—Members are determined to use every effort to prevent introduction of the codlin moth into this locality.

Mount Compass, April 13.

Present—Messrs. M. Jacobs (chair), R. Peters, W. Gowling, F. Slater, A. Sweetman, S. H. Herring, C. S. Hancock, A. J. Hancock (Hon. Sec.), and three visitors.

SEASONABLE OPERATIONS.—Sow turnips, swedes, mustard, rape, clover, and almost any green fodder.

EXHIBITS.—By Mr. A. Hancock—Dried currants, first grown in the locality; very good sample. By Mr. M. Jacobs—Good samples of five varieties of apples grown at Willunga; specimen of codlin moth from same place. By Mr. A. Hancock—Sample of apples affected by "glassy core," generally produced in damp, low localities.

INQUIRY.—Can buds of any other variety of apple be worked on to branches of Northern Spy apple, so that the branches can afterwards be cut up into short lengths for grafting on to roots of Northern Spy, and thus save double working on to the roots? [There would be much difficulty in effecting a union in such case.—GEN. SEC.]

BROOM CORN.—Mr. H. McKinley read a paper as follows :—

My two seasons' experience in growing the above may perhaps interest some of the members. I do not advocate planting the whole of the swamps with it, but only a small portion, merely enough for own use until a profitable market can be found for the fibre. The seed makes good feed for fowls and pigs, the stalks are useful for thatching, and flooring for seed potatoes, as well as fodder for stock. If the plant is to be grown for fibre and seed plant it in beginning of November, in rows 3ft. apart, and 3in. or 4in. deep. Last season I opened up drills with a narrow hoe, and then ran the drill along the trench, dropping the seed very sparingly, and when about 6in. high thinning out to 6in. apart. Keep the ground well cultivated between the rows. It takes about eighteen to twenty weeks to ripen, and by that time should stand from 6ft. to 10ft. high. If the fibre only is wanted it can be cut earlier, but if both fibre and seed are required it should be left until the seed is well filled out, but not too ripe. Then it should be cut from 9in. to 1ft. down the stalk, and dried in sheds, turning it over occasionally if heaped to any depth, to prevent mildew. Before marketing the seed should be stripped and the fibre classed according to length, and tied in bundles. When dried the fibre should be a pale green color. To grow for green fodder I think the rows only need be 1ft. apart, and the plants closer together. Plant about the same time, in a place where it can be well irrigated, cut when about 2ft. 6in. high, and if it makes good growth I think three cuts could be got off it during the summer. Broom corn, to be grown properly, requires a rich soil, and anyone growing it will find it will pay better to plant a quarter of an acre of the best part of the swamp than an acre of the poorer soils, and requires plenty of moisture. It would be worth while, those who have swamp land, to plant, say, a quarter of an acre, if only for fowl food. [The fibre is cut when the seed is nearly ripe; when cured the seed is scraped off, and the fibre baled. The green fodder, when young, is not always safe food for stock, but the whole plant is valuable as food for stock when the seed is nearly dead ripe; but it should be chaffed in order to utilise the stems.—GEN. SEC.]

Balaklava, April 13.

Present—Messrs. P. Anderson (chair), C. L. Reuter, G. Reid, A. Manley, A. W. Robinson, J. Crawford, J. Vivian, W. Tiller, and E. M. Sage (Hon. Sec.).

PIG-BREEDING.—Mr. Robinson read following paper on breeding and management of pigs :—

The breeding and management of swine should constitute one of the most important agricultural interests in South Australia. To be successful none but the best breeds should be allowed on the farms. There is no class of farm stock that pays better as between indifferent and good breeds than pigs, and the wonder is that so many farmers still cling to a breed of grunTERS which no feeding can fill. The very first requisite, however, in keeping any improved breeds from which money is to be made, is the best of feeding from the time they are born till they are slaughtered. You can neither breed nor keep pigs profitably by starving or allowing them to shift for themselves. In stock raising it holds true that what costs little to acquire brings little at sale. Care and labor to secure the best will always pay. Many years ago there was a great demand for everything big in the way of pork, big sides of bacon, big hams, &c., but now there is a decided distaste to large joints, and this appears to be growing stronger year by year. Bearing this in mind, I would recommend the breeding of the Berkshire, which possesses wonderful powers of maturing. They have hardy constitutions, are prolific, and have a much greater proportion of meat to offal than any other breed. They are active, yet docile and contented, and turn to good account what food they receive. The boar is the chief source through which the ordinary stock has to be improved, and, as the offspring are likely to take his shape, it is most important that he should be well made. If he is long on the legs, thin in the forequarter, and narrow across the loin, it is certain his stock cannot turn out well. A long snout will denote that it is a comparatively short time since he became domesticated, and he will not be so prepotent as one longer under such influences. A thick neck is not of so much value for the meat it carries, for it is not of the greatest commercial worth; but it indicates an inclination to rest, and an aptitude to fatten and to convert to profitable meat any food which is given to it. The ribs should be well sprung from the backbone, and the sides deep with thick flesh, and the flank full. A pig which is thin in the flank is not a good bacon pig, and the hams are generally badly developed. The sow, as regards shape, should be the same as the boar just described; but there are points of maternity which must not be overlooked. Perhaps the most important is that, having produced a family, she should be able to support it. It is of no use for a sow to produce more pigs than she has teats, as the weakest go to the wall, for they get no food, and soon succumb. The minimum number of teats should be twelve, for it is little use trying to breed when the maximum number of pigs is

under twelve. It is well, too, to breed from a good-tempered sow, and one which has not shown signs of a desire to eat her young, for such characteristics run in families. A sow's period of gestation is sixteen weeks. During this time she should be kept in good store condition, and have plenty of exercise. The last few weeks the call on her system by the embryo pigs is considerable, and she should all this time receive strong nourishing food. When farrowing is indicated as being near at hand the food should be controlled so that she does not develop too much milk. The sty in which she is placed should not be too freely littered with straw, which should be short, so the little pigs do not get smothered, as is often the case when the straw is long and plentiful. Should a sow slip her pigs they should be removed immediately, or there will be a possibility of her developing the fatal habit of eating her young, which habit once formed can never be eradicated. Wheat or any cereal is most valuable feed for pigs. These are, however, apt to be too heating when given alone. It is a good plan to sow a little barley in the spring, and let the pigs graze on it. The pigs thrive on green food, it is in fact their natural diet. In this way the system is kept in order and in a healthy condition. Thick runty pigs are best adapted for killing at an early age. Such pigs, if well bred, are never lean. When the aim is to kill as small porkers they should never be allowed to stunt, but should be kept in a thriving and improving condition from birth. Try to make them keep as much of their sucking-pig characteristics as possible. These points are not retained if the animals are checked, consequently the feeding of young porkers begins at birth. Pigs of more lengthy frame may be allowed to run as stores for some time, when they should be placed in somewhat confined quarters and fattened. If using pollard it will be found best to start feeding it rather thin and watery, and gradually keep getting it thicker until you have a paste which is just convenient for the animal to swallow. When fattening it has been proved that it is best to improve the substance rather than increase the bulk of the food given. In conclusion, it must not be forgotten that the pig requires something to counteract the acidity of the stomach, and this can be best given in the shape of wood ashes, a supply of which should always be provided.

Mr. Tiller considered the Berkshires the worst pigs he had ever kept. He had a pure-bred hog that would eat as much as six of his nondescript pigs, and then not do so well. The only time a Berkshire pig was quiet was when he was full. He had suckers from his mixed breeds scale 61lbs. live weight at eight weeks old. Several other members had found the Berkshires anything but quiet. Others had the same class of pigs as Mr. Tiller, and did not wish for better. They thought there was a strain of the Essex breed in them. It was agreed that once a sow eats her young she is never to be trusted, and also that the habit, as well as that of eating poultry, is almost hereditary. Mr. Reuter said, once a sow of his went after her time of farrowing, and later on was killed. He found, on opening her, the bones of thirteen young ones which must have died about a month before their full time. Mr. Reid had had a somewhat similar experience. The Hon. Secretary thought it would be better, when advocating the merits of any breed of stock, if records of the quantity of feed actually consumed, and the results obtained, could be given. At present, in many cases the listener could not but think the statements as to what an animal will do to be largely guesswork.

Johnsburg, March 30.

Present—Messrs. G. H. Dunn (chair), H. Napper, F. W. Smith, M. L. Read, J. R. Masters, P. Caughlan, J. Read, T. Thomas, T. Potter, W. McRitchie, L. Chalmers, F. W. Hombesch, T. Johnson (Hon. Sec.), and five visitors.

FERTILISERS.—Mr. Potter reported having attended trial of seed and fertiliser drill at Carrieton. He intended putting in 100 acres this year with the drill, using superphosphate. The land was fallow, and variable in character, being heavy clay, hard flats, and loose limestone, the latter being intensely friable, and what is commonly known as floury. The members were of opinion that Mr. Potter's experiment would be watched with great interest by the farmers of the district. A member wished to know whether, if the wheat drilled in

with the manure were to be in the soil during a prolonged dry spell, its germinating powers would be injured, or would it take less moisture to cause the manured wheat to germinate. [These questions do not permit of a definite answer, but many instances are on record where drilled wheat has lain in the soil for several weeks before germinating and has not suffered to any appreciable extent from being in contact with the manure. The grain itself is hardly likely to be injured, but it is possible that, under some circumstances, the germ, as it starts into growth, might suffer. It is well known that, owing to the sulphuric acid it contains, super. will attract moisture, but we have no records of any experiments to ascertain whether this would in any way affect the germination of the seed.—GEN. SEC.]

EXHIBIT.—Mr. McRitchie tabled Giant Pera cucumber, an excellent specimen grown locally. The plant had received very little attention as regards watering, and members were surprised that such growth could be produced during such dry weather as had been experienced here of late.

Redhill, April 4.

Present—Messrs. H. Darwin (chair), W. Stone, R. T. Nicholls, D. Steele, D. Lithgow, F. Wheaton, E. Ladyman, and J. N. Lithgow (Hon. Sec.).

FERTILISERS.—Discussion took place on the use of fertilisers, which is favored by all the members. It was considered that judgment would have to be used in applying fertilisers, as different soils will require different kinds and varying quantities of manure. They also thought the variety of wheat sown would also regulate, to a certain extent, the quantity of fertiliser applied. They did not think, however, that the heavy dressings advocated by Professor Lowrie would pay in this district owing to the dryness of the spring months. [Test the matter directly by putting in small plots with varying quantities of super.—GEN. SEC.]

Narridy, April 20.

Present—Messrs. J. Darley (chair), R. Satchell, D. Creedon, J. Smart, F. Smart, J. Liddle, A. Hiskey, F. Easther, H. McGar, J. Nicholson, and T. Dunsford (Hon. Sec.).

DAIRYING.—Various matters in connection with movement to secure a pure-bred bull with view to improvement of the dairy herds of the district were dealt with.

Clarendon, April 8.

Present—Messrs. J. Pelling (chair), J. Wright, H. Payne, A. Harper, E. Dunmill, W. Henty, R. Hillton, J. Chapman, J. Juers, A. A. Harper, and A. L. Morphet (Hon. Sec.).

CODLIN MOTH.—Considerable discussion on this subject took place, and a motion urging the Government to appoint additional inspectors for the Hills district was lost by one vote.

SHEEP-FARMING.—Mr. A. Harper read a short paper on "Sheep-farming on a Small Scale." For wool the Merino were best, but for carcass the crossbred gave the most profit, though they were troublesome to keep within the paddock. For the Adelaide market the Lincoln cross ewe mated with a Down or Shropshire ram would produce sheep far before the Merino. He had kept Lincolns, Downs, and Shropshires, and for past two years Merinos, but he found the latter did not take so well in the Adelaide market as the crossbreds, but on their small

areas he would recommend them on account of the fences. Good grazing land about Clarendon will keep, say, two sheep per acre, and each sheep should cut about 6lbs. of wool, and lambs about 2½lbs. to 3lbs. These should realise 6d. and 4½d. per pound respectively. The lambs will be worth from 7s. 6d. to 10s. each, according to quality. If a man in this district keeps fifty sheep he should realise from wool about £10, and from lambs £20. From this some items must be deducted. The fences will need more attention; then somebody's dog will get in and probably kill a few; and there will be deaths from natural causes. These can be put down at, say, 7½ per cent. or £2 5s. Shearing, bales, and wool-picking would amount to 13s., leaving just over £27 for labor, repairs to fences, feed, &c. The sheep also help to clean the land, and this in itself is an advantage. Mr. Harper's paper was well discussed, but some members thought few people make as much out of their sheep as Mr. Harper's paper showed.

Arden Vale, April 1.

Present—Messrs. E. H. Warren (chair), G. H. Williss, M. Eckert, A. W. Fricker, F. Schuttloffel, W. Williss, and two visitors.

FEEDING HORSES.—Mr. G. H. Williss read a short paper on this subject. They fed their horses on hay chaff and wheat chaff mixed with boiled wheat. They mixed one part of hay chaff with three of wheat chaff, and 8galls. of boiled wheat for a meal for thirteen or fourteen horses. The horses did well, kept up in condition, and performed their work satisfactorily. One of the main points in the management of horses was to get them in good condition, and keep them so if possible. They will then do more work on less food, and give more satisfaction every way than if they are allowed to get out of condition. Mr. Eckert said, from the fact of Mr. Williss's horses being always in good condition and getting through a lot of work, it was evident that the treatment outlined in the paper was satisfactory. When he first fed his own horses on crushed wheat they got sore shoulders, but he was going to try it again this year, and if it had the same result he would not use it any further. Mr. B. Liebich (visitor) fed his horses on crushed wheat, and found they did well after getting used to it.

COCKY CHAFF.—Mr. Fricker referred to best and quickest way of preserving "cocky" chaff. He had noticed that the least dampness would affect the whole heap in a very short time, turning it yellow and destroying its fragrance. He believed the best way to preserve it from injury would be to erect a large shed, and where timber was plentiful, make a floor of logs to protect it against the damp. Mr. Williss found thatch kept out the damp, even if roughly put on; he suggested a layer of straw over a log floor. Members considered a large shed for the preservation of wheat-chaff very necessary, and any surplus chaff should be carefully thatched.

Port Germein, April 6.

Present—Messrs. G. Stone (chair), D. Thomson, C. O'Loughlin, J. K. Deer, H. Kingcome, W. Crittenden, E. G. Blesing, and A. H. Thomas (Hon. Sec.).

GLADSTONE CONFERENCE.—Mr. Blesing gave an interesting report on proceedings at the Gladstone Conference, and a discussion ensued on the various matters dealt with, particularly the question of enlarging the Roseworthy farm. Members considered the present farm sufficient for present requirements.

EXHIBITS.—Mr. Blesing tabled some splendid samples of quinces and apples. Members were surprised at the quality of the fruit, and considered it proof that Mr. Blesing's locality was suitable for fruit-growing.

Caltowie, April 12.

Present—Messrs. A. Kerr (chair), G. Lehmann, G. Petatz, J. Noonan, and A. McDonald (Hon. Sec.).

FOWL TICK.—Mr. Lehmann has lost several fowls, and some geese. The fowl tick (*Argas reflexus*) was present, but he did not think they were the cause of the deaths. The Chairman said all fowl houses should be built of smooth material, so that the tick may not find crevices in which to hide or deposit eggs. Iron perches should be provided if possible. It is a mistake to have the houses too much enclosed. It is sufficient if only a roof is provided. Fowls should be closely examined for ticks, and if found they should be swabbed under the wings and thighs with a kerosene rag, and the old houses should be burned down and destroyed. A neighbor had lost about 100 fowls lately from ticks. He had not found any on his own place. Mr. Lehmann said the ticks were difficult to detect, and probably the Chairman's place was not free from them. He had himself lately built a new house, but soon found the ticks in it. He stripped off all bark, and thoroughly limewashed the whole premises, and this cleared them out to some extent. Mr. Noonan's fowls roost anywhere, and the ticks exist everywhere that the fowls frequent. He did not feel inclined to destroy his sheds every time he found ticks in them. [Build a galvanized house, with all the timber framing outside, and have removable perches, &c. When the ticks invade the place clear the interior, put in a lot of grass or straw, set fire to it. This will scorch up all ticks and eggs, but will not burn the iron or wood if a little care is taken, and a bucket or two of water is handy to put out fire if any of the outside wood should begin to char.—GEN. SEC.]

QUESTIONS.—The "question-box" inquired "Which reins—single or double—are most effective for holding horses?" Mr. Noonan thought single reins give most power to the driver. The Hon. Secretary and Mr. Petatz contended that the double or branch reins give more control than the single form; but the Chairman was satisfied that single reins are best, as his team had overpowered him and bolted whilst using the branch reins, but he could hold a bolting team with the single reins. Three members favored the cross or branch reins, and two preferred the single reins.

SHORTAGE ON FERTILISERS.—Some members complained of short delivery of fertilisers sent by rail to farmers. Not only do they have to pay for the manure that is not delivered, but they have also to pay freight charges. [This "short delivery" is probably due to the rotten condition of the bags in which the manures arrive. The acids soon destroy the bags.—GEN. SEC.]

Gawler River, March 29.

Present—Messrs. T. P. Parker (chair), H. Roediger, C. Leak, W. Clark, R. Badcock, and A. Bray (Hon. Sec.).

SEED WHEAT.—Mr. H. Roediger said the first consideration in selecting seed wheat should be to have it pure—that is, of one variety—and well matured. If exchanging seed, he would prefer to get it from a cooler locality than from a warmer one. His favorite variety is Purple Straw. It is necessary to consider whether the crop is intended for hay or for grain, and which is best suited for the market. The best marketable variety is not always that which will produce the most wholesome loaf. Plump grain is preferable to shrivelled, because shrivelled grain produces a weak, spindled plant if the season opens unfavorably. Seed wheat should be cleaned over a wheat screen if possible, because if it is of uneven grade the large seeds will produce strong plants which

will check those of a weaker growth. The unevenness in ripening, noticed particularly in broadcasted crops, is caused by the uneven grade of seed. There is really no necessity to get change of seed from other localities, since, by selecting a small quantity of the best heads every few years and propagating from them, a good quality can be maintained. Mr. Badcock said shrivelled grain will produce a good hay crop owing to their being many more grain to the bushel, and a thicker crop is produced.

EXHIBITS.—Mr. J. P. Parker tabled seeds of watermelon, mangolds, cabbage, and tree onions for distribution amongst the members.

Naracoorte, April 13.

Present—Messrs. S. Schinckel (chair), H. Buck, G. Wardle, E. C. Bates, A. Caldwell, F. Welcome, J. G. Forster, J. Wynes, Evan Thomas, and A. Johnstone (Hon. Sec.).

SOUTH-EASTERN CONFERENCES.—A proposal by Millicent Branch that the South-Eastern Branches should have two annual conferences—one for Tatiara, Naracoorte, and Lucindale, and another for Penola, Mount Gambier, and Millicent—was discussed at length, and the general opinion was that such a departure is not desirable.

"HANDLING OF HORSES."—Mr. H. Buck read the following paper on 'Twenty-five Years' Experience of Handling Horses':—

Drive the colt with help in the yard you have chosen. Be sure and see that your yard is sound and fit for your work. If the colt gets out you will have a lot of extra work and learn him bad habits. Have the colt by himself so as to have his attention on you and not on other horses. All the other animals must be out of sight. If the horse has been much heated or excited while yarding, care must be taken that he has time to cool down and get quite calm before proceeding further. You may then enter the yard with a thin pole and try to put the pole on his rump. If the colt becomes frightened and rushes round the yard, as it is sure to do, stand as quiet as possible in the centre of the yard and watch his eye and speak in a low voice to him and he will see that you will not harm him. You then may proceed again with the pole and work it up and down his back; by so doing you will get your hands on him in a very short time. The first place to touch him must be on the withers, and not on the shoulder, as the horse is liable to strike with his front feet by touching him on the shoulder. Have a little switch in your hand with a fork-like end and try to twitch it in his mane and pull the colt to you as if you had a rope on him. The next thing is to get the halter on. When that is finished you must try to get your hand over his eyes three or four times so as to close them; then pass them gently up over the near ear and close them down on his neck. If the horse will stand you can put the bridle or blinkers on him. If the breaker has no breaking-in bit a piece of flannel wrapt around an ordinary bit will act as well. Be sure and see that both reins of the bit have the same strain. The horse can then be turned into a large yard or a small paddock for three or four hours to exercise himself. After that get him in again and take the tacking off; give him a little water and some chaff and keep him in the stable. It is advisable to go through the same performance the following day for about an hour or so; then put the driving reins on him. After you have got the colt going kindly in reins it is the best time to put him in harness and put him in a light sledge. With this you can turn about any way. Drive the colt about till he is fairly warm and not overheated. This is where most people make the mistake. They drive the colt till he is fairly done up and his heart broken and his shoulder scalded. This should be avoided. I have seen horses go splendidly the first time and refuse the second day. Why is that? Because he was over done and his shoulders tender. I would advise horsemen to wash the colt's shoulders with salt water or wattle bark. If there is any tender place get a little fat and kerosene boiled and rub on it. After the horse is broken in care should be taken how he is harnessed. See that the collar is not too large; I prefer the collar being a little narrow. If the collar is too wide it will catch the horse on the point of the shoulder, and perhaps ruin him for life. See that the hames are well fitted on the collar. Care must be taken that the hames are not too light on top. As for feeding horses, give a little at a time, but often. A great many people fill the manger up, thinking that will do them good. By so feeding the chaff becomes hot and stale, and the horse will never eat so well, and gets poor on it. I have seen that proved on a farm where there were about forty horses at work. The horse is one of our best friends, and why not treat him so? I find that a little salt is very healthy in their food, and a little sulphate of iron in the water. One thing I should like

to say is that we should never forget the rug in winter. The horse will have a fine coat and will be easier kept; if the horse is not rugged his hair will get very long and he will sweat a great deal and never look well. I would like to say a little about driving horses. See that the horses are always started together, especially in large teams. If possible have the bits out of their mouths. They will work far better and will not be pulled about.

Mr. Buck added that the time for breaking in a horse depends upon the grass, but he preferred to begin at 2 years old and working lightly. Mr. Wynes had come to the conclusion that horses are broken down before they are broken in. They are handled roughly, and worked like old horses till their hearts were broken. A horse fills out until 7 years old. Chairman said horses should be broken at 2 years old and worked lightly; they work better at 2 than 3 years, having a better mouth. Care must be taken in breaking quiet colts, as they are liable to become tricky. Horses should be fed little and often. In breaking, side lines are better than the bearing rein, as a better mouth is obtained. The bearing rein is more useful on a wild animal. Mr. Forster said horses reared on stony and hilly ground can be broken in at an earlier age than those reared on plains or soft ground.

Port Elliot, April 20.

Present—Messrs. J. McLeod (chair), H. Pannell, J. Brown, W. E. Hargreaves, J. R. Coote, J. Nosworthy, H. Gray, and H. Welch.

SMALL HOLDINGS.—Some members objected to the General Secretary's interpolation of "This is meant for withering sarcasm" in Mr. Hargreaves' paper on "Small Holdings," read on January 19, after the words "There is a common idea prevalent that the man who knows everything about agricultural industries has lived all his life in the centre of a densely-populated city, whilst he who has followed this business all his life knows very little about it."

Stansbury, April 6.

Present—Messrs. A. Anderson (chair), P. Anderson, J. Antonio, J. Sheriff, C. Faulkner, and P. Cornish (Hon. Sec.).

POULTRY DISEASE.—Mr. Antonio said his turkeys and fowls were becoming blind, and was recommended to place a little sulphate of iron in their drinking water. The Chairman has cured the disease in his fowls with equal parts of olive oil and kerosene applied with a feather to the eyes and mouth inside and outside.

STRANGLES.—Mr. Antonio said strangles in horses can be cured with two spoonfuls of oil with a little eucalyptus oil in it. The Hon. Secretary said a piece of bagging treated with Stockholm tar wrapped around the bit and left in the horse's mouth will sometimes cure a cough.

Dowlingville, April 4.

Present—Messrs. J. Phelps (chair), R. H. Montgomery, H. Crowell, F. Lock, T. Illman, J. L. Broadbent (Hon. Sec.), and one visitor.

ROSEWORTHY COLLEGE.—Members are all agreed that the Roseworthy Agricultural College, under Professor Lowrie, is doing excellent work for the farming industry of South Australia, and that a still greater extension of its area would considerably increase its utility. They also think that the establishment of farms of a similar nature in suitable localities, where vines, &c., can be grown to advantage, and where dairying can be carried on with greater facility, is desirable.

QUANTITY OF SUPER.—Members think that 50lbs. or 60lbs. mineral super. per acre is enough to drill with seed in this locality, and more than 90lbs. is too much. [Try small plots at the rate of 100lbs., 150lbs., and 200lbs. per acre. In matters of this nature it is absurd to "think" without having "tried" for two or three seasons. Professor Lowrie finds that every pound weight of super. applied beyond the 75lbs. gives an increased profit over and above the cost. The dryness of any locality does not affect the question of experimentation. Try it.—GEN. SEC.]

Crystal Brook, March 30.

Present—Messrs. J. A. Symons (chair), W. Morrish, A. Hamlyn, R. Pavy, W. Natt, P. Pavy, W. Hamlyn, W. J. Venning, F. S. Keen (Hon. Sec.), and one visitor.

THE FARMERS' SHEEP.—Mr. P. Pavy read a paper of which the following is the substance :—

Farmers are properly devoting attention to improvement of farm horses and dairy stock, but are they not neglecting to improve their sheep? It is true we deal in sheep—buy, sell, and fatten stores and usually make some profit on this; but we have to consider how to increase those profits, and to make progress. The increasing trade in export of frozen lambs will necessitate the maintenance of flocks of breeding ewes, and these should be of the best, to be the most profitable—sheep that will bring the largest return from the least proportionate expense; a sheep that will when crossed with a fast-grower, produce a good lamb, mother it well, and still grow a heavy fleece of valuable wool. The Merino, excepting in rarely favorable conditions for crossbreds, will easily take the lead in this direction; but is it not possible to get a better kind of Merino than is generally owned by farmers at present? Why not try to produce a large-framed, strong, and robust Merino, yielding a sound fleece of good length, and showing plenty of character? This robust wool keeps stronger and better for a longer time than the fine wool, which latter becomes finer still and falls apart, becomes loose and open as the sheep gets older, and allows sand and sunlight to reach to the skin, and thus the value of the wool diminishes. The large animals do not usually grow so much wool on the head and neck as is produced on those parts on small Merinoes, and which collect grass seeds, and also cover the eyes, and in either case cause blindness. The larger ewe will make a better mother, will rear a larger lamb, and produce a sound fleece. Great care must be taken not to allow of any deterioration of character in the wool. The crimps and curls should be well and evenly defined, else it will go off and become hair-like. These good characteristics cannot be secured by any cross with other breeds, but must be gained by careful culling, careful purchase of selected ewes, and by using only the very best robust woolled Merino rams. Shearing should be done on a clean floor. If two boards, each 4ft. wide and the length of the waggon can be made they will be large enough to make a shearing floor for most farmers, and the boards can be used on the waggon for carting "cocky chaff," if supported by projecting crosspieces, or otherwise made to fit. Stains and wet bellies should be dried in the sun before being baled. The fleeces should never be tied with string. If a wool table is made, the fleeces can be skirted and easily rolled from breech to shoulder.

Angaston, March 20.

Present—Messrs. F. Thorne (chair), F. Salter, W. Sibley, R. Player, S. O. Smith, A. Salter, A. Friend, J. Vaughan, J. Heggie, E. S. Matthews (Hon. Sec.), and two visitors.

"ZANTE CURRANT."—Mr. F. Salter read a paper to the following effect :—

Having paid a visit to the Clare district some time ago I saw a process of treating the Zante currant vine which apparently would insure getting a good and probably a heavy crop where without this treatment it would be a shy bearer and very irregular in its crop. Before giving particulars of this process I will treat with pruning, &c., of the currant vine. There are two sorts of currants, namely, the Zante currant and the Corinth; but I have seen only an occasional vine or two of the Corinth currant. Its berries are much redder in color, and it apparently is not suitable for this colony or it would be more grown; that is it is either not such a heavy cropper or not so suitable for market purposes. I have practised in my own

currant vineyards, here at Eden Valley, different systems of pruning; first, Sylvoz-cordon on a trellis of three wires, running the one arm on the middle wire with rods bent down to the bottom wire and spurs left on the main rod for next year's rod and spur; second, the T piece. In this case the main rod is grown along the second wire and T pieces fixed to the posts, in one instance just under the middle wire, and in another slightly altered system the T piece is fixed about 6in. below the middle wire. The pruning is similar as far as the rods and spurs are concerned to those pruned on the Sylvoz-cordon system. The rods are brought out from the main stem and fixed with fine wire to the T piece wires. In some cases we leave the rods long and twist them around the side wires before fixing them. In this system also we only run one main rod except at one end of the rows where, in order to fill up the intervening space between the straining post and the vine, the main rod is run back to the strainer. In both the T piece and the Sylvoz-cordon the top wire is used simply for the summer growth, as we can tie up the young shoots to this, or they twine round of their own accord; but especially in the T piece system, I do not think that the top wire is very necessary as the growth is spread over the T piece and the vine is kept in its position by the side rods; but in the Sylvoz-cordon system the vines are more likely to blow over and damage if there is no top wire. Again, we have a trellis of only one wire, in which case we bend the rods back along the main arm on the same wire and leave spurs for next year's growth. In this system, as you will know, there is more danger of the smothering of the crop. At Eden Valley I have tried the Bordelais-spalier system, which consists of running fresh rods every year from the butt of the vine along one wire; but I found in the year in which I tried this that the currants smothered too much. As far as I can judge at present, I consider the T piece immediately below the wire, or 4in. below with one main arm the best system, though there are advantages in having two main arms, as this gives additional support to the trellis. The chief objection to this is the difficulty of having bearing wood in the space between the two main arms, whereas in the case of having only one arm the main rod can be brought right up to the other vine, and if necessary, a little past the bend of the next. I have tried checking the rods in order to make them bear in different ways by fracturing the wood where the rod is bent by giving the rods that are turned down a sharp twist, and also by twisting thin wire around each bearing rod at the base, that is, where it leaves the main stem; but so far the results have not been satisfactory. The reason, I think, in the cases cited, is partly that the check given the sap is not all round the rod evenly, but there are places in the rod where the sap flows through. However, I think that the trials I have given to the different processes would be more satisfactory if the vines were older. They are about eight years old now, where most of the experiments have been tried. The reason for checking the sap is to cause the fruit to set well. At Clare I saw the result of a process which evidently carries out this result in a most effectual manner. It has been in use in the island of Zante for a number of years. At Clare, in a currant vineyard of about seven acres where practically all the vines had been ringbarked was as follows:—From November the 10th to the 17th the vines are cut round the main stem as near the bend as possible, or rather about 4in. from the bend, with a very sharp knife a pruning knife with a fine edge was recommended for the purpose. The vine is cut right round once, and then as close as possible to the incision already made another cut is made around, which will take out a piece of bark about the thickness of a fine wild oat straw. This cut widens somewhat owing to the adjacent bark being loosened in the process. The cut heals over the same season, but a mark is left on the stem showing plainly where the cut has been made. The result was in the highest degree satisfactory in setting the crop and making it large. The owner of the vineyard reckoned to have about 7 tons to the acre, which is a very exceptional crop for the Zante currant vine. The land was exceedingly rich, having about 7ft. of black soil, and the vines were very vigorous and healthy, growing in a low-lying situation. The crop set remarkably well, the bunches resembling the sherry grape in their clustering appearance and not like the straggling bunches we so often get, the fruit being larger. Finally, then, the reasons in favor of this process are that it causes the fruit to set well, gives a finer sample in size, and in exposed situations where at setting time the hot winds are likely to cause the berries to fall I think it would be specially beneficial; also in strong-growing vines where the tendency is to make wood, and the setting of the fruit often poor. The objections to it are, in my opinion, as under:—The possible shortening of the life of the vine, the question whether the fruit ripens as well, as there was a green tinge noticeable on the currants on the trays in the vineyard where this treatment was adopted. I would not recommend it for weak or very young vines, and I think it well in giving this a trial to treat every other vine only. The question has been asked if it is necessary to ringbark the vines every year, but not having tried it I cannot say. The owner of the vineyard which I have referred to told me that he had practised it for several years. He had some young vines ringbarked. There is one point that I should like to mention, that it is well to have the part shaded where the cut is made if possible, as it aids the healing over of the wound. The question to consider is whether it will pay to possibly shorten the life of our currant vines in order to get very much better returns for the fewer number of years, and insure more regular crops, rather than to put up with light and more uncertain returns for a longer period.

Lipson, April 6.

Present—Messrs. G. Provis (chair), J. Brown, H. Brougham, C. Provis, J. Wishart, jun., A. B. Wishart, E. F. Potter, E. Thorpe, H. Brown, G. Carr, J. McCallum, and E. J. Barraud (Hon. Sec.).

ANNUAL REPORT.—Hon. Secretary reported nine meetings holden during past eleven months, with average attendance of over eight members, against seven last year. Thirty splendid exhibits of products had been made.

FEEDING HORSES.—Members discussed the best method of feeding oats to horses. [What did they say, or did they arrive at any conclusion? Surely something could have been reported of what was said or done, so that other Branches might learn what is the opinion of Lipson members upon this subject.

—GEN. SEC.]

PICKLING WHEAT.—"Will seed wheat be damaged if pickled for a length of time before sowing?" was a question submitted by a member. It was considered that care should be taken to dry pickled wheat before bagging it.

OFFICERS.—Chairman and Hon. Secretary thanked and re-elected. Mr. E. H. Thorpe was elected Vice-Chairman.

Bakara, March 29.

Present—Messrs. R. Barrow (chair), H. J. Dietrich, A. Hermann, T. Hermann, J. Roy, R. Wilson, and F. E. H. Martens (Hon. Sec.).

PLUMP v. SHRIVELLED SEED.—All members agreed that plump seed was the better, although inferior grain would do well under favorable conditions. The plant from the plump seed would, however, stand the dry weather better.

BUNT BALLS.—Mr. Dietrich said with a common cleaning machine it was possible to blow every ball of bunt out of the seed wheat.

Arthurton April 11.

Present—Messrs. W. H. Hawke (chair.), W. Short, J. Pearson, C. L. Palm, W. E. Hawke, M. Baldock, J. W. Parker, and J. B. Rowe (Hon. Sec.).

FEEDING AND WATERING HORSES.—The Chairman believed in feeding with long hay, except at dinner time, when he would give short feed. He considered Tuscan the best hay wheat, and wheat and oats mixed better than either alone. He would mix the seed and sow together. Old horses will require more short feed than young animals. Mr. Palm agreed; he did not like Algerian oats, as they have a tendency to cause scouring. A ton of Cape oats was, in his opinion, worth $1\frac{1}{4}$ tons of wheat as hay. Wheat for hay should be cut when it has lost the flower. Mr. Short thought it should be cut while in flower; he preferred to sow wheat and oats for hay separately. It was decided that, in the opinion of the Branch, good mixed hay or chaff is superior to either wheaten or oaten hay separately. The question of watering horses was also discussed, some favoring watering before feeding while others would let them have a little to eat first. The majority decided that it was better to water them first unless the horse is known to be overheated. Members were of opinion that the medium wheats, such as White Tuscan and Purple Straw were the best to mix with oats to cut for hay.

POULTRY COMPLAINT.—Mr. Palm's fowls are suffering from some disease. They go blind; the head and eyes become much swollen, and they die in the course of a few days. [This is most probably a bad case of diphtheretic roup.

Isolate all birds showing signs of disease and bathe the head and eyes twice daily in weak solution of permanganate of potash or chlorinated soda. Give each fowl a roup pill. GEN. SEC.]

IMPACTION IN CATTLE.—The Chairman referred to Mr. Valentine's statement that "dry bible" was caused by dry feed accumulating on the bible. He could not reconcile this with his experience; he had lost several cattle at different times in the spring when in the pink of condition and no dry feed about. All the animals were running in the same paddock, and he attributed it to some poison plants. Mr. Pearson said it did not matter where his cattle were feeding, he could not keep a cow for any length of time.

Stockport, April 29.

Present—Messrs. J. F. Godfree (chair), J. Smith, D. G. Stribling, F. Watts, T. Howard, G. Thomas, and J. Murray (Hon. Sec.).

BURNING STUBBLE.—A conversational discussion on the question of whether it was beneficial or otherwise to burn stubbles took place. Some members favored burning the stubble, but others differed, and no satisfactory conclusion was arrived at. Mr. J. Smith found that wherever a heap of chaff was burnt the succeeding crop was heavier on this portion than on the adjoining land. He had always better feed off burnt stubbles than on unburned stubble paddocks.



INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and found Employment by Government Departments and Private Employers from March 29 to April 29, 1901.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youth laborers	134	185	328
Carpenters	10	2	11
Bricklayers, masons, &c.	7	—	16
Boilermakers, blacksmiths, and assistants	8	1	5
Iron moulders ..	4	—	3
Fitters, and turners	5	—	2
Enginedriver and fireman	1	1	1
Apprentices	13	1	1
Cleaners	14	15	—
Carriage-washers and junior porters.....	36	19	5
Painters	1	—	6
Cook, baker, and sculleryman	1	1	3
Miners	11	—	3
Stonebreakers ..	—	—	6
Granite dresser	—	—	1
Farm hands	—	—	1
Rivet boys	2	—	8
Watchman	—	—	1
Deck hand	—	—	1
Mariner	—	1	—
Rock-drill driver	—	1	—
Bookbinder	1	—	—
Tinsmith	1	—	—
Totals	249	227	400

April 29, 1901.

A. RICHARDSON, Bureau Clerk.

The Factories Act.

CONTRIBUTED BY CHIEF INSPECTOR BANNIGAN.

The Factories Amendment Act, 1900, is divided as follows:—

Part I.—Records and Notices:

Part II.—Boards:

Part III.—Machinery:

Part IV.—Supplementary.

PART I.

Records and Notices.

(1) Every occupier of a factory shall keep—

(a) A true record, in such form and giving such particulars as may be prescribed, of the names, work, and wages of the persons employed therein, and in addition the age of every such person who is under 16 years of age:

- (b) A detailed record of all fines levied upon his employés, and such records, together with the record mentioned in sub-section (a), shall be produced for inspection whenever demanded by the inspector:
- (c) Affixed, in legible characters, in some conspicuous place at or near the entrance of the factory, and in such other parts as an inspector may from time to time direct, and in such a position as to be easily read by the persons employed in such factory, a notice or notices containing—
 - I. The name and address of the inspector for the district.
 - II. The holidays and the working hours of the factory.
 - III. True copies or abstracts of such parts of the Factories Amendment Act and regulations thereunder as may be prescribed, or as may be directed by the Minister.
 - IV. The name of the occupier of such factory.
 - V. The determination of any Board as to prices and rates of payment while the same continue in force.

In the event of a breach of any of the provisions of this section, the occupier shall pay a penalty not exceeding twenty shillings for every day during the continuance of such breach.

(1) Every occupier of a factory for whom work is done elsewhere than in such factory shall keep a record, and in such manner and containing such particulars as may be prescribed, of the description and quantity of such work, and of the name and address of the person by whom the same is done, and the prices paid in each instance for such work.

(2) Such record shall be kept for the information of the inspectors, who alone shall be entitled to, and may at all reasonable hours, inspect and examine the same.

(3) Every occupier of a factory shall forward such record to the Chief Inspector whenever demanded, and in such form as may be prescribed.

(4) The Chief Inspector shall publish in the *Government Gazette* for general information any such particulars contained in any such record, including the name and address of any such occupier, as the Governor may think necessary or desirable.

No such particulars shall be so published except in regard to some breach of The Factories Amendment Act for which such occupier has been convicted.

(5) Every person who issues or gives out, or authorises or permits to be issued or given out, any article or material whatsoever for the purpose of being wholly or partially prepared or manufactured outside a factory, for trade or for sale, shall be deemed to be the occupier of a factory for the purposes of this section.

(1) Every person who outside a factory wholly or partly prepares or manufactures any article or material for trade or sale shall, either personally or by written notice, register with the Chief Inspector his full name and address, and also from time to time in like manner register with the Chief Inspector any change in such address. Every such written notice shall be transmitted through the post free of postage if the envelope containing the same is marked with the words "Factories Act."

(2) Every person so registered shall answer all questions put to him by an inspector as to the person for whom the articles are being prepared or manufactured, and the price or rate to be paid to him therefor.

(3) Every person guilty of a breach of sub-sections (1) or (2) of this section shall, for every such offence, be liable to a penalty not exceeding ten shillings.

Journal of Agriculture

AND

Industry.

No. 11. REGISTERED AS] .

JUNE, 1901.

[A NEWSPAPER. VOL. IV.

NOTES AND COMMENTS.

Following a dry April. May has been an exceedingly disappointing month, exceeding all former records for warmth and dryness. Up to the 27th nothing but a few unimportant showers had been recorded in any part of the agricultural areas, and the change which brought rain on the date mentioned was very partial in its effects; nice rains being recorded in the Lower North and southern districts, but very little falling in the Northern Areas. Fears are entertained by many farmers that large areas which were sown early will have to be resown, owing to the seed having malted. Whether this will be the case remains to be proved; in fact, the excessive dryness may have prevented this loss. Feed is very scarce, and with the cold weather coming on is scarcely likely to be plentiful. In the Far North most farms are nearly if not quite devoid of feed, and the stock are either being fed on cocky chaff and other feed purchased from other districts, or have been removed to pastoral districts further north which benefited by the soaking rains experienced several months since. Although a good average has been obtained in previous years when but little rain fell until June, the prospects of a good harvest in the earlier districts at least are very unpromising.

In order to save trouble and money in respect to the procuration of forest trees from the Forest Department it has been usual for some member of a Branch of the Agricultural Bureau to act as agent for members and friends. A catalogue of trees for distribution is obtained, and the member makes out a list of the persons requiring trees, stating the postal address of each applicant and the number of varieties wanted, and forwarding same to the Forest Department in Adelaide, from whence an order on the nearest forest nursery is returned, and the member then procures the trees and divides the cost *pro rata* amongst the applicants.

Animal warmth is produced at the cost of food. Winter weather considerably reduces the warmth of animals, and this loss must be recompensed in some way, else the animal will lose in condition and health. Loss of warmth can be partly prevented and the comfort of the animal ensured by the use of rugs. The rugs need not be costly, because old bags even can be utilised for the purpose.

The rugs can be kept in place by straps or cords, and should be removed during the daytime whilst the animals are out in the paddocks. Cows, especially, will benefit from the employment of rugs, as they have the double drain upon their digestive organs in providing for the maintenance of warmth and condition and in supplying milk.

The Dunedin (New Zealand) Horticultural Society has notified the General Secretary of the Agricultural Bureau that a conference of fruitgrowers and a show of fruit will be holden in Dunedin from the 24th till the 29th June, and that the Society expects an attendance of between 50,000 and 60,000 visitors. The Society asks for exhibits of kiln-dried, sun-dried, and other preserved and fresh fruits from South Australian growers, and thinks that trade might be promoted between the two States.

Planting of fruit trees will be in full swing now, and it behoves every would be planter to put in such sorts and varieties that will be most profitable and satisfactory to him. He must not only decide upon what he shall plant, but also upon the source from whence the trees are to be obtained. There are men who have no regard for their own reputation who will supply all sorts of rubbish, and fix labels promiscuously upon the trees without any regard to the varieties to which they are affixed. After many years of care the unfortunate grower discovers that his trees must be chopped down. It will pay better to give a really good payable price to an honest nurseryman for reliable trees than to buy rubbish by auction at ridiculously low prices.

The State Entomologist of Georgia, U.S.A., since March, 1898, has caused to be dug up and burned 300,000 trees, which were infested with the San Jose scale—most of them so badly that they were beyond recovery. Last autumn a nurseryman in Tennessee began to ship trees into Georgia which were covered with the scale. He was warned not to ship, but persisted in doing so. As a result, 30,000 of his trees were seized and burned. This nurseryman threatened to bring suit for the destruction of his property. The case was submitted to the Attorney-General, who decided that the State Entomologist had the right to destroy such infested stock, and that it was his duty to destroy it. That ended the case.

The time has gone for ever when a man could, without any experience whatever, go upon a block of land and become a farmer. Farmers nowadays are not born so—they have to be “made” or educated to the business ere they can be successful. “A little knowledge” in this case “is a dangerous thing,” because he must possess no end of knowledge upon a great variety of subjects in order to be master of his business. Every young man who proposes to follow farming as a life pursuit should try to get a three years’ training at the Agricultural College.

Lemons for keeping should be clipped from the trees with a piece of stalk attached and when they are showing the first faint tinge of yellow. The skin should be smooth and the end or eye filled up. They must be handled very carefully to avoid bruises on the skin. The best size is 2½ in. and never more than 3 in. in diameter. As there are lemons in all stages of development on

each tree, those only of the correct size should be clipped off. Lay the fruits on trays for a week in a shady dry place, then wrap each in proper tissue paper and pack carefully in shallow, well-ventilated boxes, and tier them in a cold dark room, one box on the other. Open the door and window at night and keep all closed during the day. It is important to have all the lemons in each box of one size.

Paspalum dilatatum, or "Golden Crown" grass seed was distributed by the Central Agricultural Bureau several years ago for trial by some of its Branch members, but no good result followed. Latterly it has been considerably "boomed" in the eastern States, and naturally many inquiries have been made here respecting the grass. There never has been any doubt that it is an excellent fodder grass, but it will thrive only where there is a good average rainfall, such as prevails in the South-East, south, and hilly country. It does not grow well from seeds, but thrives from transplantation. Young plants can be purchased from growers in the eastern States for 12s. per 1,000. It should be considered whether it will not be cheaper to sow lucern, perennial rye grass, and other fodder plants in localities where *Paspalum* would grow.

The Tasmanian Entomologist writes that the statement that the San Jose scale had been introduced with apple cuttings received from South Australia is without foundation. At one time it was thought possible that some cuttings of Strawberry Pippin forwarded by the Agricultural Bureau several years ago to the Tasmanian Department were the means of introducing this scale, but this was proved to be incorrect, the source of infection being apparently nursery stock from New South Wales. Unfortunately for Tasmanian growers, the scale is found to exist in more than one locality, a considerable number of trees being infested. The regulations dealing with the importation of plants into South Australia frequently come in for abuse from persons introducing ornamental plants, but the interests of the fruit and vine industries are of more importance than the inconvenience that may be experienced in complying with the regulations.

The Queensborough Branch of the Tasmanian Agricultural Bureau had reason to comment upon a condemnation of Bordeaux mixture as a cure for scab on apple and pear trees, made by a Victorian newspaper. The members, who live in a fruit-growing district, disagree with that condemnation, and state that its value is being better appreciated every season.

The pear slug (*Selandria cerasi*) has become a serious pest in Victoria and Tasmania, and it is strange that South Australia has so long escaped the infliction. The "slug" is the maggot of one of the sawflies, and it eats the leaves of many trees, but is particularly fond of the pear and cherry. Dust, lime, and hellebore powder are each effective agents in the destruction of the slimy larvæ of the pear slug, but "prevention is better than cure," so every fruitgrower should be constantly on the watch to prevent its introduction, or, if introduced, to at once notify the Department of Agriculture, so that prompt measures may be adopted for its suppression.

A cure for tick fever, it is said, has been discovered by a Mr. Carmichael, of Gladstone, Queensland, who gives 1oz. of nitre to affected animals, and in every case they recover their health within twenty minutes, although they are for a time rather weak. The remedy has proved effective, he says, even when the animals were apparently dying. If this is correct it is a most important discovery.

"Whilst the grass is growing the steed may starve." West Australian gold-miners must wait during many years whilst the newly-planted apple and pear trees in that State come into full bearing because their rulers will not allow those fruits to be imported under any conditions whatever from South Australia, where codlin moths exist. Meantime the few Westralian growers are reaping a golden harvest for their locally-grown fruit.

In a month or two the young locusts will emerge from the egg-cases deposited in the soil. They will be no bigger than dog-fleas at first, but will be very hungry. They will cluster together at night under any shelter. One ounce of arsenic can be dissolved in 1qt. of boiling water if 1½oz. of common washing soda is put with it. The quart of water will serve for 10galls. of water in which 3lbs. of coarse ration sugar or molasses has been dissolved. The 10½galls. of mixture can be used on as much ½in. chaff or chopped maize stalks as will absorb it, and that stuff scattered broadcast where locusts abound will attract them from 30yds. distance. When a locust dies his fellows eat it, and thus the poison will act again. A very little poison goes a long way to prevent locust invasion when it is used early in the season.

It may be admitted unreservedly that the tuberculin test is not an *infallible* diagnostic for tuberculosis, but it is undoubtedly *reliable*. Millions of cattle have been tested by this agent, and it still remains to be proved that in any one case the disease of tuberculosis has been communicated thereby. In nearly every case where reaction has taken place the animals have been found to be tuberculous. Failures in testing have occurred, but it is reasonable to infer that, in some cases at least, those failures may have been due to defect in the tuberculin, or in the time and method of administration. Not every man is competent to conduct the test, but it is *reliable* as a diagnostic when properly administered by a competent person.

According to the *Indian and Eastern Engineer* for December last, there are large deposits of magnesite in Southern India, and a firm in Madras has for some time been experimenting with a view to producing a satisfactory white cement plaster having a magnesian basis. They have succeeded, and are now manufacturing a perfectly white cement for plastering walls, which is cheap, easily applied, and takes a polish like marble. It can be painted or colored by mixing coloring matter, and walls plastered with this cement dry so rapidly that in forty-eight hours or less rooms are ready for habitation. The finely-polished surfaces can be easily washed down, and from a sanitary point of view are perfect. The cement is practically as strong as Portland cement, and can be moulded like plaster of Paris. [There is a possibility that magnesite could be discovered in South Australia.—ED.]

POULTRY NOTES.

By D. F. LAURIE.

Vermin.

Although less troublesome at this season of the year than in spring and summer, still, in neglected establishments, there will most probably be some vermin of one sort or another. The most dreaded is the poultry tick (*Argas reflexus*). No opportunity should be missed of hunting down these pests; a free use of kerosene, or hot lime wash, containing sulphur and carbolic acid, will, in time exterminate them. Many people labor under the disadvantage of dirty neighbors, whose neglected fowlyards breed vermin, which travel across to the clean ones adjoining. It is a pity some legal enactments concerning poultry hygiene are not framed and enforced. The common red mite is also found in neglected houses, especially those constructed of bags and rubbish; they may be described as feeding on the birds only at night. They hide in the day time in cracks and crevices, and in the filth in the corners, and in old nests, where they are found in myriads. They are very prolific, and can remain for months without food; the ova hatch rapidly; the young are at first silvery-white, with six legs, like a true insect. They moult their skins several times, the castings of skin form a whitish-silvery powder seen on the perches and in cracks. With age the color of these mites darkens; when gorged with blood they are quite red in appearance. Light and air are distasteful to them; they prefer dark, damp, filthy quarters. Provide dust baths and limewash freely. Treat the perches daily, and the houses every week.

Exercise for Poultry.

This is a matter which usually escapes general attention in relation to birds kept in confinement, although in many cases birds with an ample range are so ill-fed that they mope about all day in a torpid state awaiting the next meal, instead of foraging for at least a portion of their living. Contrary to general opinion, the active and light breeds stand confinement far better than the heavy sedate breeds. Minorcas, Leghorns, Andalusians, Hamburgs, all do very well in confinement, because their active nature and restless habits keep them constantly on the move. The heavy breeds in confinement move but little and generally assume a contented look, which, however, soon shows the signs of a torpid liver and deranged digestive organs. Many ardent breeders, who through circumstances can only afford their birds limited space, make up the deficit by providing scratching rums, covered or otherwise. It may be considered a good practice to fork over the ground and bury grain in it for the birds to scratch for; if the soil is frequently renewed and a little lime, sand, gravel, and sharp grit added, the practice is excellent, but I am afraid the average breeders's back is not sufficiently flexible to enable him to do this as it should be done. It has been long the practice of many to lay all sorts of blame on purebred poultry, accusing them of want of constitution and proneness to disease, but as a rule, and under proper conditions, the purebred birds have better constitutions and are superior in every way to mongrels. It is entirely the fault of breeders, who mismanage and feed on improper food, provide no exercise, and generally allow their yards and houses to remain in a filthy condition. How can one expect good stock from diseased birds? Birds which are overfat and are suffering from chronic liver disease, or are tainted with roup will lay eggs, and there will result chickens, &c., but what sort of constitutions will they have? Mongrels or barndoor birds treated in the same manner will do likewise. Mongrels are generally small active birds, and thus stand a better chance of surviving. A good

dust bath is essential to poultry when in confinement; the materials are cheap and easily provided; they are road dust, ashes, a little slaked lime, and sulphur. The lime will not do for birds intended for exhibition.

Cost of Production.

This is a very important matter, and one that I have referred to many times. Lately a considerable correspondence was conducted in the Press, many of the writers making most extravagant statements proving their lack of knowledge on the subject, in addition to proving their inability to feed and attend properly to their birds. That poultry will pay if properly treated is proved to most sensible people; practical breeders know it by actual experience. The amount of harm these inexperienced people can do is unfortunately very great. People are apt to attach undue importance as to anything that appears in print.

It is not often that a breeder of any note will give exact and precise information. Readers may remember an account I gave of an egg farm near Kantomoo; at least egg-production was a prominent feature. In this case all the information I could glean was as follows:—Mr. J. T. Hair kindly allowed me to inspect his books, and from them we extracted amounts totalling about £140 as paid to the farmer for eggs laid by his hens, which numbered some 220 or 230, principally White Leghorns. In answer to inquiries at the farm I learned that the family used eggs daily at all seasons and very freely; also that a great many were sold to hawkers and others—of these I took no account nor made any allowance for them. I was told that once a week a bag of wheat was emptied into a large box, from which the birds helped themselves as they thought fit. Boiled rabbits were given occasionally, and a somewhat poor supply of water was given them. Allowing £1 per bag for the wheat, a sum really in excess of its average value, we found that close on £90 net profit accrued yearly to this farmer, taking into account the eggs purchased by Mr. Hair only. Many others have told me that their profits average 10s. per hen per year for eggs alone; in addition, all stock sold has been additional profit.

To Mr. W. B. Wyllie, of the Dunlop Butter Factory, Kapunda, I am indebted for further and more precise information. It is gratifying to publish actual experience of others, as such will strengthen my contentions. Mr. Wyllie says:—

I have no particular love for poultry, more than other farm animals. I have always succeeded in getting a good income out of them for the last twenty years under various circumstances and conditions. All my previous-poultry keeping has been done in yards; now they are allowed to run at large, but are fed and housed in colonies, and I have been surprised to find that they keep to the colonies without any trouble whatever. I am now housing 330 head of poultry in six houses and fed in six colonies. The houses are composed of various material. All have wooden frames; some covered with straw, galvanized iron, and old bags; some covered with all galvanized iron, and one part stonework and galvanized iron. For the whole twenty years, up to the time of writing, I have never had a tick in one of my houses, and it is a very rare thing to find a louse on a fowl. The houses are cleaned out every morning, without exception. My son 13 years old cleans them. It takes him one hour every morning to clean the houses, collect the manure, and put it out in the paddock. The quantity of manure so collected and disposed of for the year under review (April 1st, 1900, to April 1st, 1901) has been 6½ tons; that does not include the sweepings of the yard, but only what was taken out of the houses. Then we keep the whitewash brush continually going. All the food is weighed, and there is nothing given without weighing. My second son, 15 years old, weighs and prepares the soft food; the time occupied in doing it is two hours a day. The method of preparing the morning feed is to scald copra cake with boiling water over night; in the morning potatoes are boiled and mashed while hot; then water is added to make them like a thick paste; bran and flour are added to the copra cake; the potatoes are then thrown over it and the lot mixed together. Each colony's quantity is then weighed and given to them as soon as they can see to pick it up in the morning. For the mid-day feed the copra cake, crushed barley, crushed oats, and bonemeal are put in a tub and scalded with boiling water; then the bran and flour are added, and the whole lot is thoroughly mixed and weighed again for each colony. At night they get clean wheat.

The following is (dry weight) the daily ration for 330 full-grown fowls, as given by Mr. Wyllie:—

<i>Morning.</i>	<i>Midday.</i>	<i>Evening.</i>
Copra cake .. 3lbs.	Copra cake... 2½lbs.	Wheat 12lbs.
Bran 4 "	Barley, crushed 2 "	—
Flour 3 "	Oats crushed.. 2 "	—
Potatoes..... 3 "	Bonemeal 1½ "	—
—	Flour 2½ "	—
—	Bran 2 "	—

After preparation the following quantities are allotted to each of the six colonies:—

<i>Morning.</i>	<i>Midday.</i>	<i>Evening.</i>
Colony No. 1—3½lbs.	3½lbs.	1½lbs.
" " 2 5 "	5 "	2 "
" " 3—6 "	6 "	1½ "
" " 4—6 "	6 "	3 "
" " 5—8½ "	8½ "	4 "
" " 6—7 "	6½ "	—

This is hardly ever varied as regards the total quantity, but the amount given to each colony is subject to considerable variation. Example: If No. 2 colony decreased their quantity of eggs and I found that the fowls were getting too fat I would reduce their food scale and give it to No. 5 because I find that they have increased their quantity of eggs and require the extra.

My food for newly-hatched chickens is oatmeal and crushed barley sifted to get the rough husk out, with unlimited milk to drink. After the first week they get a mixture—oatmeal, crushed barley, pollard, and copra cake. The chickens are kept in portable runs, so that the large fowls cannot possibly touch their food, until the chickens are about ten weeks old; then they are put in the colony where they are intended to be kept and they never leave it.

Since I started with the incubator (two years ago) I have hatched over 1,000 chickens; the cost of eggs and kerosene has been 1d. per chick; the average cost of feeding to ten weeks' old has been 5d. per chick, and they have had as much as they could eat, but nothing to waste. That they have been well fed and grown is proved by the fact that the pullets laid at 16 weeks old, with very few exceptions. Of the first two incubator lots that I hatched every one laid under 16 weeks old. It might be interesting to know the value of separated milk fed to farm animals. In the year 1896 separated milk fed to pigs returned 3d. per gallon; 1897-1898, fed to calves, returned 1d. per gallon; 1899-1900, fed to poultry, returned 2d. per gallon.

It will be seen from the above extract that these birds are managed by hard workers, who adopt precise methods. The fact that two lads do all the work shows what brains will do. I think I stated in last month's *Journal* that Mr. Wyllie had told me that for the year 1900-1901 (April to April) the cost of his eggs was 2½d. per dozen. How does this tally with the statements published that eggs cannot be produced for less than 9d. per dozen?

My best advice to those who are not deriving profit from their poultry is to obtain good birds and amend their ways of feeding, &c. Do not blame the poultry; the grower is alone to blame. I know a good many who cannot achieve much success in any direction, through want of application and disinclination to adopt better methods. This feeding is decidedly generous, and is suitable for egg-producing or for forcing on birds for sale. It would require modification when dealing with the heavier birds and in the production of stock birds.

Poultry in Orchards.

I have quoted many instances where much benefit has been derived from poultry in orchards. I quoted a case where in England a worn-out old cherry garden was turned into a poultry run, the trees were roughly pruned, and next season the ground was ploughed; a double purpose was served of manuring the soil and giving the birds fresh ground to run over. In a few years the trees were again in full bearing. "Wandin," in the *Austral Cultivator*, speaking of Mr. Grant's orchard, Pakenham (where the black spot in apples is being combated), says—"I saw in my wanderings through this very large orchard a large number of Golden Wyandotte varieties of poultry, and they are, Mr. Grant says, very valuable in keeping the orchard clear of codlin moth. The fowls look to the surface of the well-worked soil and tree trunks, whilst the

spray takes the body of the tree. I quote Mr. Grant's remark—'If fruit-growers knew the value of fowls in the orchard they would keep them extensively.' Personally I intend running fowls in my garden, and am quite certain that with spraying, trapping, and poultry all the harm the codlin moth can do me will be very slight. My experience is that ducks and fowls, if kept in fair numbers, will clear off every insect of any sort. Chickens are invaluable for destroying aphides, curculio, and other small pests; they thrive well and do no harm. Even among orange trees the harm is slight, and a little attention with a rake will remedy this.

Incubators.

I am in receipt of a good many inquiries for reliable incubators. There are two I can recommend; the one illustrated and described by myself in this journal of October, 1899, I consider, as do many who use the same, the best hitherto invented. It is my own design and is constructed on scientific principles, the laws of radiation of heat, also the sudden changes of temperature to which we are subject. I did not patent the invention, but described it freely for general benefit, and Mr. E. Gibson, of Glenelg, turns out a well-made machine on that model at a very moderate figure. Messrs. Vardon & Heicus, of Adelaide, manufacture the "Royal," which is a close copy of Hearson's patent "Champion," which is a good machine and hatches well, but is not so reliable during sudden changes, as the temperature of the egg-drawer is not acted on directly, as in my invention. Modern methods demand the assistance of artificial incubation.

Stock.

No time should be lost in procuring good stock. Local breeders, with few exceptions, do not assist me; their prices are too high for fair birds, and the general run, with few exceptions, are inferior. However I am always ready to advise people and will, where I can, put them in the way of obtaining what they want.

DEVELOPMENT OF THE DANISH EGG TRADE.

The following is a striking illustration of the old adage "Union is strength." Our farmers would be consulting their own interests were they to pay more attention to the small things of the farm.

There has been quite a remarkable development in the export trade in eggs from Denmark into Great Britain during the past five years, a circumstance which may be gathered from the fact that while the total quantity of eggs exported from that country in 1895 amounted to over 200,000lbs., the quantity exported in 1899—the last year for which the official returns are forthcoming—worked out to 5,000,000lbs. For this remarkable increase in the Danish export trade, the whole of the credit is given to the system of co-operative organisation introduced between five and six years ago. For the purpose of this organisation local societies were established all over the country, whose members engaged to deliver fresh eggs, and upon whom a fine of 5s. 6d. was imposed for every bad egg delivered after once fair warning had been given. A deduction was also made from the price paid for eggs if dirty ones were delivered, but no washing of the eggs was permitted. The eggs were marked with the distinctive number of the member and the local society, so the sender of every egg could be ascertained. From each member the eggs are collected weekly by the local societies, who send them to the central establishment in boxes with cardboard partitions, each holding fifty score. The price paid to

the members is the sale price fixed by the central society, less the cost of collection and export. Thus in 1899 the value of the eggs was fixed at 5½d. per lb., from which just one half-penny was deducted for expenses, so that the price paid to the farmers was 4½d. per lb. The fee paid by each member on entrance to the society was 6d. for life membership. The rapid growth of the society during the past five years is shown by the following figures:—

Year.	No. of Local Societies.	No. of Members.	Eggs Exported.
			lbs.
1895	6	2,000	176,000
1896	260	14,000	1,540,000
1897	320	16,000	2,860,000
1898	340	18,000	3,630,000
1899	365	22,000	4,828,000

In addition to this society there are now several other co-operative organisations for collecting and exporting eggs. The following figures show the effect of the movement in increasing the total export of eggs from Denmark:—

Year.	Value of Eggs Sold.
1880	£50,000
1885	£200,000
1894	£400,000
1899	£865,000

And not only has the quantity of eggs been increasing, a better price has also been obtained for them, for, after deducting cost of collection and export, the price paid to the farmers has been—

	Per lb
In 1897.....	4½d.
1898.....	4½d.
1899.....	4½d.

No better illustration could be given of the powerful influence for good of such co-operation.—*Exchange*.

HOW CHOICE BUTTER WAS MANUFACTURED.

BY G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

To show readers how necessary it is to be careful in every branch of dairy work when the manufacture of high-class butter is the ambition of the dairy farmer, I have pleasure in directing their attention to a very striking illustration of the success that followed the efforts of one of our dairymen. The person in question had all along earned a good name as a competent butter-maker, and the price paid for his butter was evidence of its high standard of quality. But the farmer was not satisfied, as he believed that improvement could be made in his methods of working, and better results obtained. With this laudable object in view he attended a course of lectures in the science and practice of dairying, and at the close of the session the farmer was a fortnightly visitor to the Government dairy laboratory, bringing with him samples of cream and butter for testing purposes. Bacteriological and chemical examinations were made of the samples submitted; and, during his visits, the farmer did good work in educating himself to judge the acidity in cream by comparing his determinations as found by taste with the readings on the acidity apparatus. In due time he was able to control the development of acidity, which enabled him to churn cream at the proper stage of ripeness, thus securing the best flavor with a minimum loss of butter in the buttermilk.

Bacteriological Cultivation of Cream and Butter.

Readers are now well aware that contamination of dairy produce can be brought about by the activity of germ life, and in searching for the cause of taints it is customary to grow the many kinds of organisms contained in the product to be examined. Throughout the months occupied in testing the farmer's cream and butter germ invaders became less numerous, and ultimately a perfect product was obtained.

In Plates 1 and 2 will be seen numerous colonics of germs and moulds that are recognised as hurtful to good cream and butter.

The quality of this sample of butter when first examined scored 95 points, but at the end of fourteen days it lost in flavor, and was awarded 90 points.

As time advanced the bacteriological condition of samples improved, and in the course of a few months the farmer's care and diligence were rewarded in pure cultures of the ripening organisms being found in both the cream and the butter.

The flavor of No. 3 cream was characteristic of fine quality, and compared with what has been repeatedly written in the *Journal of Agriculture* (see *Journal*, November, 1899). The butter was also of the choicest flavor, with a high keeping quality, which was exemplified in the practical examinations to follow :—

	Flavor.	Texture.	Total.
Maximum points.....	60	40	100
Awarded	59.5	40	99.5

A second test was made fourteen days after the date of manufacture, and the flavor had been so well maintained that only one point was considered sufficient to deduct from the previous figure.

How the Butter was Made.

The following is an account of the feeding of the cows, and particulars of the manufacture of the butter, as narrated by the farmer :—

1. The cows are fed twice daily on a chaff and meal ration, moistened before feeding.

2. The food is given immediately before milking.

3. The udders of the cows are washed and dried before milking.

4. The cream is separated immediately after milking, night and morning.

5. Cream collections are made in 1 gall. quantities, and sixteen hours before churning all the cream is mixed together to allow an even distribution of acid. Stirring is done at intervals.

6. Ripening is so regulated that, at churning, the cream is acid and sweet to the taste, and the flavor attractive.

7. Churning temperature is 58° F.

8. Cream is churned into grains.

9. After one washing the butter grains are brined in a strong solution of 5ozs. of salt to 1lb. of butter. No dry salt is used.

10. The butter is worked once.

The farmer informed me that the brining is a great advantage as little working is necessary, and no crystals of salt are noticeable on the surface of the butter or paper. His experience goes to prove that the extra cost for salt is well repaid in the advantages gained by this practice of brining.

In an analysis of the butter (No. 4 plate culture), I found the following percentages :—

Fat.	Water.	Curd and Salt.	Melting Point.
87.13	10.01	2.86	87°

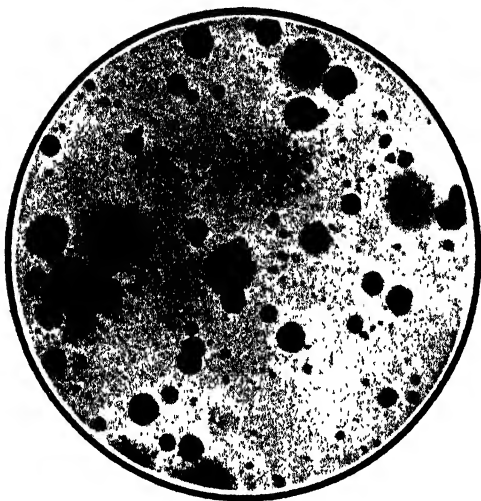


Plate 1.—Cream colonies showing the cream-ripening organisms and hurtful germs and moulds.

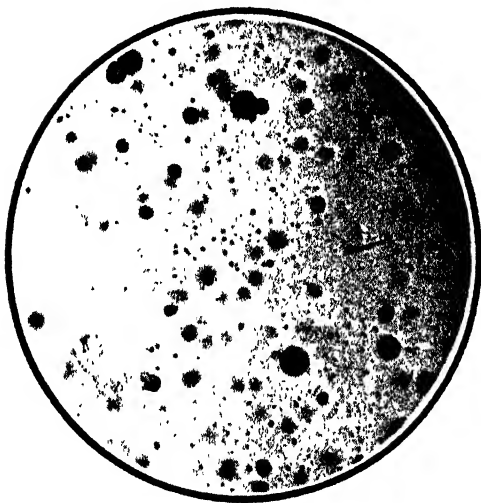
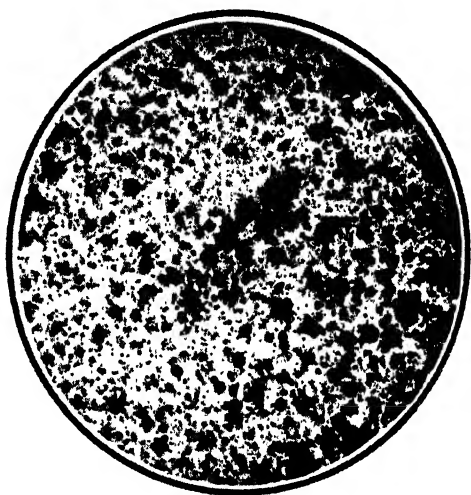
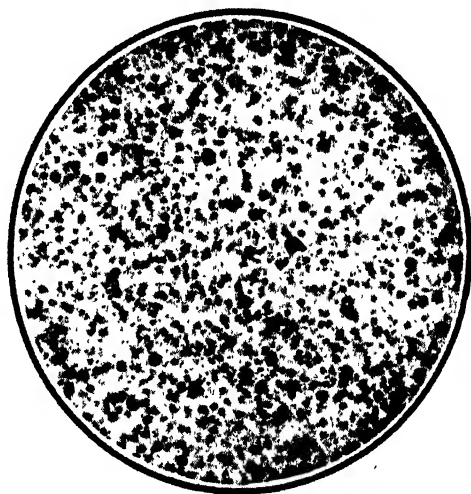


Plate 2. - Butter colonies of lactic and injurious organisms.

*Plate 3.—Cream colonies
of lactic acid organisms.*



*Plate 4.—Butter colonies
of lactic acid organisms.*



The texture of the sample was soft, and only slightly increased in hardness during the three weeks.

I may mention that the number of cows kept at this dairyman's place is eleven, and a few days before this article was written 11lbs. 13ozs. of butter were manufactured from 24galls. of milk. The 24galls. represented what was left over from one day's milking after a quantity had been sold.

Hard Butter.

In last month's *Journal* a short article is written on the above subject. Since publication I have received five half-pound samples of butter from a farm where this hardness was very troublesome. One of the half-pounds was from a quantity of butter manufactured according to the instructions given, but the cows were fed with hay and bran in the dry condition; the other half-pound was from butter made in the way previously practised on the farm. In comparing the solidity of the two butters it could be distinctly felt by the hand that the butter made according to the instructions was softer than the other sample.

Submitting the two half-pounds to analysis the percentage of water in the hard sample was 4·8, and in the soft 10·7. I would advise attention to the feeding of the cows, as recommended in last month's *Journal*, and churn the cream into large grains—not small, as stated in the article published.

COLD STORAGE.

Cold storage of perishable produce is very largely practised now in Europe and America, and has been resorted to by a good many tradesmen and dealers in Australasia. Adelaide does not mean to be behind in matters of progress, and there is an evidence of this spirit in the establishment of the Adelaide Ice and Cold Storage Company in Morphett Street, near its junction with Hindley Street. The advantages that may be secured by fruit growers, amongst other producers, from the presence of such works may be worthy of earnest consideration. Many of our most esteemed fruits come in with a rush; the market becomes so overburdened that extremely low prices prevail for a few days, and then "the season" for such fruits is over. By gathering a quantity of them when just becoming ripe and placing them in cold storage rooms they will mature slowly and remain in the most perfect good condition for periods varying from six weeks to six months, during which time the price must rise, because there are none others of the same varieties procurable. Lemons, for instance, come in when there is next to no demand for them, because the weather is cold; but by placing them in cold storage they can be put upon the market when hot thirsty weather sets in, and when that fruit is in great demand. Samples of fruits that have been kept in most perfect condition for several months in the above cool chambers were sent to the office of the Central Agricultural Bureau on May 27, from a collection then in cold storage, which included pears—Williams' Bon Chretien, Duchess d'Angouleme, Glou Morceau, Vicar of Winkfield, L'Inconnue, Gansell's Bergamot, Josephine de Malines, and Marie Louise; grapes—Doradilla, Muscat Gordo Blanco, Almeria, and Malaga; apples—Cleopatra, Rome Beauty, and Jonathan; plums—Golden Drop and White Magnum Bonum. Most of the above were stored in January and February and some in March. Fully ripe fruits do not keep long in good condition, as they become wilted and lose their nice fresh appearance, but those stored when just ripening develop their full color and beauty under a moderately cold temperature.

THE DISEASES OF WINES.

By ARTHUR J. PERKINS, GOVERNMENT VITICULTURIST.

(*Paper read before the S.A. Vinegrowers' Association on May 29, 1901.*)

II.*

Retrospective and Introductory.

In an earlier paper we reviewed the principal causes that give rise to the appearance of disease; we discussed those factors that tend to render one wine more delicate or more liable to disease than another; and finally we examined in detail the general external features that distinguish the diseased from the normal healthy state. Hitherto, therefore, we have but dwelt on the general aspect of the question: to-day we may descend to details, and enter upon the study of the various forms of parasitic disease that within comparatively recent years have been investigated for us by science. It may be premised here that it is quite possible, nay, very probable, that the last of these parasitic micro-organisms has not yet been brought to light by biological research, and that in this direction the field of original work is not necessarily closed. It is, however, very significant of the thoroughness with which Louis Pasteur carried out his self-imposed task of investigation that, since 1863, when he first set about to unravel the involved skein of what was then but vaguely suspected to be "diseased states of wines," that since then, in spite of the presence in the field of a veritable army of workers, only two or three new forms of disease have been identified and described; and, so far as I am aware, none of his observations or conclusions relating to those diseases that came under his notice have since been invalidated, or even seriously controverted. Such statements might perhaps at first sight appear to do but scant justice to the Dane, Hansen, whose classical work in connection with the brewing industry they would seem to overlook. On consideration of the matter I do not think that this will be found to be the case. According to this distinguished investigator many of the defects in beers are attributable to the development in the *wort* of what are known as "*wild yeasts*," most of which are true *Saccharomycetes*, or at all events, in contradistinction to the disease germs previously identified by Pasteur, they possess as a normal function the power of generating a true alcoholic fermentation. I am not, however, aware that Hansen has ever been able to give a true *chemical* definition of the changes for which these wild yeasts would appear to be responsible, and which would tend to justify their inclusion amongst disease germs properly so called. The latter are usually more or less vaguely described as inducing turbidity, or the development of various foreign and consequently objectionable tastes or odors. Nevertheless if these organisms so modify beers as to endow them with new and abnormal characteristics, the term "disease germ," freely applied to them by Hansen, cannot be said to be misapplied. "If so with beers, why not with wines?" it may perhaps be asked; in fact, Hansen himself (without, however, bringing forward any personal work or experimental proof in support of his views) has hinted as much. It is certainly true that the skins and stalks of the grapes introduce a great variety of yeast cells into our fermenting vats; nor would I care to deny that it may possibly in time be proved that some of them exercise a more beneficial action on the wine than others, or even that under certain conditions some may affect it deleteriously; but of clear proof that such is the case we have for the present absolutely none. For the rest, in wine fermentation what have we that can go by the name of "*wild yeasts*"? The term

* Continued from *Journal of Agriculture* for December, 1900.

presupposes the existence of cultivated yeasts; but where are they? It surely cannot seriously be maintained that a few successive years of laboratory culture has so modified the original properties of certain yeast cells as to render them immeasurably superior to those that from time immemorial have been provided by Nature! To the same extent that in agriculture we distinguish betwixt cultivated plants and their wild prototypes, betwixt domestic and wild animals, to the same extent are brewers entitled to differentiate betwixt cultivated and wild yeasts. For centuries they have grown them under artificial conditions—in varying states of purity, it is true, but sufficiently constant for the requirements of the day; and it is with the immediate, but probably modified, descendants of the latter that they are working at the present time. It is almost needless to point out that such conditions do not, nor ever have, obtained in wine cellars. However correct Hansen's views may have proved in the sister brewing industry the unquestioning extension of them by winemakers to their own immediate concerns does not commend itself to my judgment. Radical changes in general practice can hardly be adopted on mere conjecture, particularly when the practical benefit to be derived therefrom is, as in the present case, highly problematic. Yeast cells of an objectionable nature may possibly occasionally find their way into the fermenting vats. We have not, however, yet been made aware of their presence, nor have we yet any practical means of eliminating them should they in time be detected. On the other hand, unquestionably the useful yeast cells must predominate in our vats, or else how is it that we have hitherto always succeeded in making good wines or, at all events, been able to satisfactorily account for occasional failures?

I take it therefore that new diseases, if there remain any more to be discovered, will probably prove of a nature similar to those already known to us, and in accordance with what I endeavored to prove in my earlier paper, their ultimate identification will present more of a theoretical than practical interest. For obvious reasons it is not the fame of the doctor that the winemaker should ambition, but that of the nurse, able to bring wines scathless and free from blenish through the trying periods of infancy and youth to well developed maturity. For if there is one indubitable fact that a knowledge of the life history of the various disease germs imparts it is that against one and all of them practically the same precautionary and preventive measures are equally effective; let any one of them be neglected by the merest hair's breadth and the wine becomes open to attack. And again, if there is one unquestionable fact that ordinary experience early brings home to us it is that a tainted wine, however well "doctored," never regains its original state, nor can it at any future time represent anything like its original intrinsic value. The strict adherence to the recognised canons of wine-making is, therefore, of greater importance to the ordinary wine maker than the discovery of new diseases, and in consequence what interest attaches to this question partakes more of a theoretical than a practical nature.

Classification.

Of the diseases that are known, and have been studied and described, we may roughly establish two classes:—

A. Those living on the surface of the liquid, and drawing from the surrounding atmosphere the oxygen necessary to their respiratory functions. Such germs have been characterised by Pasteur as "aerobic." In wines they become apparent to the naked eye in delicate films that speedily cover exposed surfaces.

B. Those living immersed in the depths of the liquid on which they prey. Oxygen is as necessary to the latter as to those that live on the surface, for on this earth there is no living organism, however insignificant, that does not,

whilst in active development, absorb this gas or, in other words, breathe. But, immersed in a liquid so notoriously devoid of it in the free state, whence can they derive it? Fish are far from presenting a parallel case, for the water in which they sojourn holds oxygen in abundant solution. Wine beaten up in free contact with the atmospheric gases will, if examined shortly after, certainly show traces of free oxygen; not so, however, if subsequently left at rest for some period of time. Of wines kept in the ordinary way it may be said that they never contain even traces of free oxygen, excepting perhaps immediately after racking. From them, however, may always be extracted carbon dioxide in varying quantities, and a certain amount of free nitrogen. The latter gas is the residuum of the atmospheric gases that had at some time or other penetrated into the wine. The oxygen, however, disappears almost immediately entering into combination with some of its immediate constituents. These immersed germs therefore can find in the liquid no available free gas. So well adapted, in fact, have some of them become to this mode of life that to them the presence in large quantities of this usually life-giving gas is frequently fatal. Oxygen, however, in some form or other they must obtain, and, according to Pasteur, they take it from compounds already rich in this gas, which they split up into simpler bodies of lesser oxidation. It is on this principle, for instance, that is based the fermentation of grape juice by ordinary wine yeast, and it is on it that must rest the action of many disease germs. In opposition to surface germs that take their oxygen from the air, Pasteur has designated them *anaerobic*, prefixing "aerobic" with the Greek negative *a* or *an*.

We may now proceed to the individual examination of the different parasites included within these two classes.

AEROBIC DISEASES

Within this class we may include three well-known forms of disease. The following are the names by which they are more generally known:—

- I.—Flowers of Wine.
- II.—Acetic Fermentation.
- III.—Moulds.

FLOWERS OF WINE OR HYDROCARBONIC FERMENTATION.

General Naked-Eye Characteristics.—The germs responsible for this particular form of disease live on the surface of the liquid in coherent masses, or colonies of a brilliant white hue. Under conditions favorable to their development they envelop in a continuous white film the whole of the available surface; not unfrequently however, they are found in scattered floating flecks of white matter, that gradually gain in size, come in contact one with the other, and finally by their junction establish the continuity of the film. This substance, though bathed by the liquid, does not appear to be wetted by it, so that it resembles large oil drops floating on the surface of the wine. Age generally dulls the dazzling brilliancy of the characteristic whiteness of the film, which gradually becomes more or less suffused in pink; the absorption of a certain amount of wine-coloring matter may perhaps give the *raison d'être* of this phenomenon. Beneath the surface film the liquid still retains its original brightness; and in no wise can any form of turbidity in wines be looked upon as a consequence of this disease.

Microscope Characteristics.—Under the microscope these white masses are seen to consist of an agglomeration of unicellular plants, held more or less loosely in contact one with the other. Each cell is a separate individual, consisting of protoplasm, or living matter, bathed in cell liquid, and enclosed within a special cell membrane. In general appearance these little plants show some resemblance to yeast cells; they are, however, more oval in shape, of greater



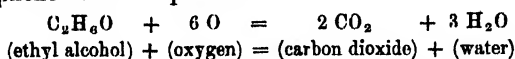
PLATE 1.—FLOWERS OF WINE (AFTER PASTEUR).



PLATE 2.—ACETIC GERMS (AFTER PASTEUR).

relative length, and more flattened out. Their average length varies from four to five *microns**, though under special conditions, favorable to their growth, they frequently acquire even greater dimensions. As with yeast cells, the usual form of reproduction of these disease germs is "budding"; like the former, too, they occasionally give rise to the Endospore formation, and may therefore be classed amongst the *Saccharomycetes*. These germs are usually known by the name of *Mycoderma vini*: *Saccharomyces vini* would, however, perhaps be more correct. (See Plate 1.)

Chemical Action on Wines.—These germs live on various constituents of wines, and in that sense tend to impoverish them. The main action, however, consists in the destruction of alcohol; the latter is slowly burnt up into water and carbon dioxide. The following chemical equation more or less accurately represents the phenomenon in question:—



In other words, these minute plants take from the atmosphere that surrounds them the oxygen gas that it contains, and with it burn the alcohol of the wine into water and carbon dioxide. They treat in a similar way, though to a lesser degree, any sugar that may be present, the ethers of the wine, and, in fact, anything present susceptible of easy oxidation. Their depredations do not, however, end there. The substances above referred to do not furnish them with all the materials necessary to the building up of their tissues. For this purpose the wine is equally impoverished in phosphates, sulphates, nitrogenous matter, &c.

It will be noticed that *Saccharomyces vini* does not leave in the wine, as a waste product, any substance of pungent or disagreeable taste, and in consequence the flavor of the wine is not very materially affected thereby. It becomes, however, more or less flat and insipid; normal maturing is also considerably hindered. Further, if left long under the influence of these parasites, the wine becomes considerably weakened, and less able to resist the attacks of more dangerous germs.

Conditions of Development.—The existence of a vacant air space in cask or vat is a condition essential to the first appearance of the disease. First, because *Saccharomyces vini* can only grow on the surface of the liquid; and second, because it must be surrounded by an atmosphere containing a certain amount of oxygen. The amount of this gas necessary to its vital functions is extremely large, and in view of the paucity of the supply its growth, under ordinary conditions, is generally slow. In the ullage space oxygen is soon replaced by carbon dioxide, resulting from the combustion of the alcohol, and it is but slowly, and by diffusion, that the latter gas gradually makes way for a new supply of atmospheric oxygen. The relative slowness of the action of the parasite may be gauged by the following figures:—In order to reduce the strength of 1 gall. of wine from 20 per cent. proof spirit to 19 per cent. it must have free access to the oxygen contained in over 5 cub. ft. of air. These figures, as will be seen later on, when compared with those that can be given for acetic germs, imply, under conditions that obtain in the bunged-down cask, an exceedingly slow rate of development.

The progress of the disease is slow in cold weather—more rapid when temperature rises; so much so that in certain of the colder French wine-making countries—the Jura, for instance—no particular account is taken of the disease, and its films are freely allowed to invade the surface of the ullaged casks. Needless to add that such a practice is not to be recommended under warmer latitudes; nor, as a matter of fact, in a general way, even in the colder ones,

* A "micron" is the unit of measurement used in microscope work. It is equal to $\frac{1}{1000}$ of a millimeter, or about .00004 of an inch.

for it is but rarely that these germs are to be found in a state of purity on the surface of wines. Intermingled with them may usually be seen the more dangerous acetic germs.

Weak wines poor in alcohol form the media most congenial to the tastes of *Saccharomyces vini*, and they form the most frequent objects of its attacks. It is nevertheless occasionally met with in comparatively strong wines of from 14 per cent. to 15 per cent. of alcohol.

Remedial and Preventive Measures.—On this portion of the subject I do not intend here entering into minute detail. This I leave for the more important acetic fermentation disease, against which practically identical measures have to be taken. Briefly speaking, this question may be summed up as follows:—The disease will occur at the first favorable opportunity. In anticipation of this do not leave casks on ullage for any length of time; keep filling them up at regular and frequent intervals. The area of the surface that the slightest evaporation leaves exposed in straight vats being very considerable, do not use the latter for storage purposes. Whenever filling a cask carefully examine the surface of the liquid *with the aid of a candle*. If any film be present remove it completely by filling up by means of a small funnel, the stem of which penetrates a few inches below the surface of the liquid; this will bring the film to the bung hole, when it can readily be removed. If on subsequent visits it has made further development carefully fill up the ullage space with strong spirit instead of wine. If the latter be slowly poured in it will float on the surface, and, in virtue of its antiseptic properties, destroy any germs that will in all probability have become attached to the staves immediately surrounding the bung hole. The scalding of the bungs, or their immersion in strong spirit, is also to be recommended. Weak wines in which the disease persists can with advantage be racked into sulphured casks.

ACETIC ACID FERMENTATION.

General Naked-Eye Characteristics.—As in the previous disease, we find here also the characteristic formation of a continuous film over the surface of the liquid. From that of *S. vini* it differs however in tint, being at all times dull-colored and more or less tinged in red. With age it considerably thickens and becomes almost membranous in texture. Below the surface film the wine generally shows bright and clear. It generally, however, emits the characteristic odor of acetic acid, and in time that of acetic ether.

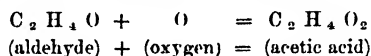
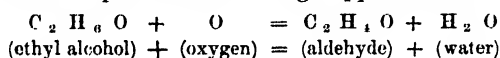
Microscope Characteristics.—Under the microscope the germs occasioning the present form of disease are seen to differ considerably from *S. vini*. True the film still consists of an agglomeration of unicellular plants; but the individual cells differ widely in general appearance from those of *S. vini*. They are of more reduced dimensions, not exceeding 2 to 3 microns in diameter, more or less spherical in shape, and generally slightly constricted along a median line. Reproduction takes place here not, as in the former case, by budding, but by segmentation. A cell wall gradually grows along the line of central constriction, resulting finally in the formation of two cells out of one. If undisturbed these cells remain connected one with the other in the shape of the figure 8. It is this peculiarity in the method of reproduction that gives rise to the chaplets or chains of cells characteristic of the disease. The cells appear to have the power of exuding a sticky gelatinous matter that keeps them connected together in the characteristic film or veil; it is the latter that is known as "mother of vinegar." (See Plate 2.)

Recent research tends to show that there exists in reality more than one species of micro-organism responsible for this form of disease. It is probable, however, that they are usually to be found intermingled one with the other, nor, as their respective actions on the wine appear to be identical, does this

fact present any very great practical interest. Pasteur, supposing them to belong, one and all, to the same species retained the name *Mycoderma aceti* ascribed to them by earlier writers. With the progress of biological knowledge this name has had to give way to those of *Bacterium aceti* and *Bacterium pastorianum*—two special forms studied by Hansen. It is probable, however, that these two do not complete the list of germs capable of inducing the acetification of wines.

Chemical Action.—This disease is characterised by the gradual formation in the wine of acetic acid. It is a waste product of the vital energies of the parasites with which the wine is infested. If the latter are left unmolested the wine becomes ultimately transformed into vinegar. Under ordinary circumstances it merely assumes a disagreeably acid flavor, and is said to be *pricked*. Its volatile acidity steadily rises with the progress of the disease.

Here again we have a phenomenon of oxidation. The alcohol of the wine is gradually oxidised into aldehyde and subsequently into acetic acid. The following two chemical equations give a rough approximation of the process:—



This partial oxidation, this incomplete combustion of the alcohol, is the result of the vital functions of the germs living on the surface of the wine. In the first place we had an example of complete combustion of alcohol into water and carbon dioxide, and accordingly the ill effects to the wine were comparatively insignificant. In the present instance the action is far less complete; there is formation of water, but in smaller quantities, and a residuum of acetic acid capable of still further oxidation: the results are also correspondingly disastrous to the wine. The fact of the incompleteness of oxidation in the latter case is well illustrated by the following fact. In the manufacture of vinegar, as soon as all the alcohol present has been changed into acetic acid, unless the liquid be rapidly drawn off from contact with the "mother," the latter will immediately proceed to attack the acetic acid it had previously formed, oxidising it into water and carbon dioxide, and wasting the strength of the vinegar.

For what special purposes these bacteria destroy the alcohol of wines it is somewhat difficult to determine. They probably seek to extract from it materials necessary to their growth and the building up of their tissues. In the course of this process they split it up into simpler bodies, which, being in the "nascent" state, readily combine with surrounding oxygen. It is further perfectly evident that, like *S. vini*, the micro-organisms at present under consideration cannot live on alcohol alone; all other constituents necessary to their well-being they must also borrow from the wine, which in consequence becomes proportionately impoverished.

Whilst on the chemical aspect of the question there is one important point that cannot be overlooked. Under the conditions that prevail at vintage time and during the subsequent operations of wine-making is the partial acetification of wine possible by a purely mechanical process and without the intervention of micro-organisms? This question has principally relation to the acetification of the floating cap, particularly when the latter is composed of both skins and stalks. There are few, who watching under such conditions the progress of a *slow* fermentation, have not frequently noticed towards the outset of fermentation a strong odor of acetic acid. Is this phenomenon, that is frequently of serious consequence to the wine, to be attributed to the action of micro-organisms or to the mechanical combination of alcohol and oxygen brought in contact one with the other within a porous body? If a certain amount of diluted

alcohol be dropped on a highly porous body such as platinum black it readily combines with the concentrated oxygen which the latter contains, and by purely mechanical action there is formation of acetic acid. It is true, however, that the success of the experiment depends largely on temperature conditions; 35° C. is said to be the minimum limit at which the combination will take place. In the vat at the inception of fermentation the cap rises slowly to the surface, and is gradually drained of the liquid it contained. When well divided by the woody stalks of ripe bunches it forms under such conditions an eminently porous body. The seat of the slowly-developing fermentation is immediately below it, and the first alcohol formed is rapidly imbibed by the stalks, where it may possibly find itself under conditions similar to those described in the experiment previously referred to, and become mechanically oxidised into acetic acid. The phenomenon of course ceases as soon as fermentation has made sufficient headway to replace the oxygen by an ever-rising flow of carbon dioxide. Whether this oxidation is to be referred to biological or mechanical causes is perhaps of slight consequence. Personally I favor the latter explanation; others may prefer the former. The formation, however, of acetic acid is undeniable, and at a later stage it will be necessary to consider what practices hinder its formation.

In the long run, in the process of maturing some portion of the acetic acid that may have accidentally developed in a wine tends to disappear; it combines with ethyl alcohol and forms what is known as acetic ether. Some few of our wines are badly affected with it; this defect, however, is far less prevalent than it was a few years back. I have tasted even imported ports, quoted at a pretty high figure, simply reeking with it. I am afraid that had they to pass through my hands for the London Depot they could hardly have been allowed a certificate. When this ether is present in such quantities as to overpower the action of all other volatile substances, and practically form the whole "nose" of the wine, it affords conclusive proof of the latter's unsoundness. To those who are not familiar with this characteristic odor I would recommend the purchase of a small quantity of the pure article. They will find in it an example of what the "nose" of a wine should not be.

Conditions of Development of Disease.—This question has to be considered from two points of view—(1) Development of the disease in the fermenting vat; (2) Development of the disease in the cask.

In the vat the formation of acetic acid in dangerous quantities may take place either at the beginning or towards the end of fermentation; the latter case is of more frequent occurrence than the former. I have already endeavored to explain the conditions that occasionally lead to an early acetification of the liquid. It will therefore suffice to add here that such a phenomenon only becomes possible with a floating cap. Where the cap is maintained immersed in the liquid by means of a false head—a practice that obtains in most of our cellars—all danger of early acetification disappears. Towards the end of fermentation acetification of the new wine, even with a false head in use, is possible, though to a lesser degree, than when the cap is allowed to float on the surface. During the course of active fermentation the liquid, and even the cap, if the latter floats on the surface, is protected from the action of acetic germs by the rapid evolution of carbon dioxide that prevents contact with oxygen of the air. This is of course more markedly the case with closed vats than with the open ones in general vogue here. As soon, however, as fermentation shows signs of abating, in spite of the high density of carbon dioxide, the atmospheric gases gradually replace it in part on the surface of the liquid, and the latter, unless rapidly withdrawn, runs the risk of possible acetification.

In casks, once the silent fermentation completed, unless the latter are rapidly filled up, acetic germs will develop on the free surface of the liquid. At later

periods, like *S. vini*. they find their opportunities in casks left on ullage. Here, given favorable conditions of growth, their development is far more rapid than that of the "flowers." Duclaux calculated that under such circumstances they were capable of covering with a continuous film a surface one square metre in extent in the space of twenty-four hours, representing the formation within that time of three hundred thousand million cells. For their purposes they require less oxygen than *Saccharomyces vini*, and consequently under similar conditions they will destroy a greater quantity of alcohol than their rivals. In order to reduce the alcoholic strength of 1 gall. of wine from 20 per cent. p.s. to 19, instead of over 5 cub. ft., they need the oxygen contained in little more than 1½ cub. ft. of air.

Weak wines, poor in alcohol, are more liable to attack than others. Wines containing as much as 13 per cent. to 14 per cent. alcohol are not absolutely beyond the reach of the germs. Wines containing a certain amount of unfemented sugar seem more susceptible to the disease than perfectly dry wines.

As vinegar manufacturers are well aware, temperature is a factor of extreme importance in the development of *Bacterium aceti*. It rarely appears on wines the temperature of which does not attain to 16° C. Wines kept in warm cellars are therefore in greater danger than those in cooler ones.

Finally, the germs are liable to attack empty wood vessels that had at some time or other contained wine. Casks, vats, &c., become saturated with wine, and however well cleaned always retain small quantities of the liquid. Unless these vessels are maintained full of an atmosphere devoid of free oxygen, such as sulphurous acid gas, the acetic germs will develop in the staves and taint the casks.

(To be continued.)

MUSTARD SEED.

Why should our manufacturers have to import mustard seed when it can be grown in South Australia? There must be some reason for the neglect. The present price of the seed is 12s. per bushel of 56lbs., and the yield in England is put at from 30bush. to 50bush. per acre, with 10 tons to 15 tons of green forage, if used for that purpose. Seed should be sown any time from beginning of June till middle of July. The quantity of seed, if drilled, to sow an acre, is about 5lbs. The drills should be 3ft. to 4ft. apart, and the seed should be covered between ½ in. and 1 in. deep. It is well to roll after sowing, and to use the horse hoe when the plants are up, and thin out the plants to about 2ft. apart in the rows. Deep, friable, rich soil suits this plant the best, as the roots run deeply.

The crop is ready to harvest when the seed pods begin to get brown or crisp, and must be gathered quickly then. The seed heads should be cut off, and the wagon should have a cloth in the body. The seed is threshed out on cloths on a very clean floor.

The proprietor of the Waverley Vinegar and Mustard Works, West Terrace, Adelaide, is prepared to supply seed for sowing at the cost price to him in Adelaide, namely, 12s. per bushel, and states that he will purchase the produce from that seed, if of equally good quality, at 12s. per bushel. Farmers in the South-East and the Hills districts, who have suitable land, will do well to consider this matter. Even if a surplus on local requirements were to result, the seed ought to be valuable for export purposes. Mustard ought to be grown here to a considerable extent to furnish early green fodder for sheep and other live stock.

FERTILISERS FOR POTATOES.

In previous issues of this journal reference has been made to the experiments in the manuring of potatoes carried out by the New York Agricultural Experiment Station. These experiments have now extended over a period of four years, and the results are of interest to potato growers. One of the most surprising is the fact that although the tuber and tops of the potato contain a large proportion of potash, the use of large quantities of potassic fertilisers has not been justified by the results. As these experiments have been carried out on four different farms for four consecutive years, considerable weight must attach to the conclusions derived therefrom. In 1898 the application of 40lb. nitrogen and 80lbs. phosphoric acid gave just as large an increase as when an additional 100lbs. of potash was applied. In the two succeeding years the application of large or small dressings of potash had very little effect. On other soils, of course, very different results will possibly be obtained. As, however, potash is a costly ingredient of most potato manures, the point is worthy of extended test in other classes of soils.

The experiments referred to have also shown that the largest average profit was realised from dressings of 1,000lbs. of manure per acre. Heavier crops were obtained from the application of 1,500lbs. and 2,000lbs. per acre; but the profit was less. Taking the average of the whole of the plots throughout the four years, the money gain from the application of 1,000lbs. of manure per acre was \$10.60; from 1,500lbs. \$8.95; and from 2,000lbs., \$5.70. In some instances 1,500lbs. per acre was decidedly more profitable, but it is evident that there is considerable risk of a lesser profit resulting from the use of anything more than 1,000lbs. per acre. The results are based on a mixture containing 4 per cent. nitrogen, 8 per cent. available phosphoric acid, and 10 per cent. potash. Phosphoric acid is evidently an important factor in potato fertilisers, as a mixture containing less of this, but more of nitrogen, gave almost uniformly inferior yields. As each mixture contained a considerable excess of phosphoric acid above the needs of the crop, as shown by the analyses of the plants and tubers, it is evident that there is still much to learn in regard to the extent to which the fertilising ingredients applied to the soils are recovered by the crop. The proportion of available plant food in the soil is also only one factor in crop production. The soil texture, situation, warmth, and supply of humus, must all receive attention.

In Great Britain experiments have been carried out with the same object in view—that is, of ascertaining the quantity and kinds of manures most profitable to apply to potato crops. The results of experiments carried out in Cheshire, Yorkshire, Northumberland, Durham, and various counties in the centre and south-west of Scotland, have been summarised by Professor Wright in the *Journal of the Board of Agriculture*, of England. These experiments also show some striking lessons. One of the most marked is the ability of different varieties to respond to liberal treatment—a point usually lost sight of. In the Cheshire experiments two varieties—British Queen and Hough Giant—were manured with stable manure. The application of 15 tons of manure per acre resulted in an increase of 9 tons 18½cwts. and 7 tons 10cwts. per acre respectively, an increase of 2 tons 8½cwts. in favor of British Queen. With a light dressing only of commercial manures an even more marked difference was shown, both results indicating that British Queen was capable of responding to the application of manure to an extent impossible to Hough Giant. In the Durham experiments Up-to-date and Bruce potatoes were used. A dressing of 9½cwts. of commercial manures increased the return from the former to the extent of 4 tons 14cwts. per acre, whereas Bruce only improved to the extent of

3 tons 6cwts. In the Scotch experiments Up-to-date and Maincrop gave within $10\frac{1}{2}$ cwts. of each other when unmanured, but the application of a manure that increased the return from Up-to-date to the extent of 5 tons per acre was only capable of increasing the yield of Maincrop to the extent of 3 tons.

The British experiments appear to show that, as a reliable fertiliser for potatoes, farmyard manure occupies a high place. As in the American experiments referred to, there was a limit to the quantity that could be profitably applied. Ten tons to 12 tons per acre under most circumstances was more profitable dressing than 15 tons to 20 tons. This was also borne out by the experiments with mixtures of farmyard and commercial fertilisers. In the Glasgow experiments for 1899 the addition of 6cwts. of commercial fertiliser to 20 tons of farmyard manure only increased the crop to the extent of $7\frac{1}{2}$ cwts. per acre; but when the same commercial fertilisers were given with 10 tons of farmyard manure, the increase amounted to 18cwts. per acre. The quantity most profitable to apply will always vary with the season and the soil. With commercial fertilisers alone the crops are more liable to injury from drought, and do not on the whole produce so good returns. Not much weight is paid to this portion of the experiments, as farmyard manure is regarded as practically indispensable, and is nearly always obtainable in sufficient quantity to apply at least a light dressing.

ANALYSES OF FERTILISERS.

By W. L. SUMMERS, INSPECTOR OF FERTILISERS.

In the following tables will be found particulars concerning the analyses of various samples of fertilisers obtained by myself during the present season, and analysed by Mr. W. E. Hargreaves, Agricultural Analyst.

In the tables the number of samples of each fertiliser obtained, together with the highest and lowest analyses and the average of all the samples, is given; the registered guarantee of the vendor is also given for comparison. In the ordinary mineral superphosphates only the percentage of water soluble phosphate is guaranteed; consequently the samples are only tested for this. In each case these supers. will contain, in addition to the water soluble phosphate, small and varying quantities of citrate soluble phosphate, and acid soluble phosphate. The supers. manufactured by the Adelaide Chemical Works and L. Mehrtens and Co. are sold under guarantees which specify the amounts of citrate soluble phosphate; the results of analyses given in the table show the percentages of this form of phosphate. Some of these fertilisers also contain nitrogen and potash, but as the guarantees are mostly very low, they are not usually tested by the department.

Thomas Pho-phate.			Acid-soluble Pho-phate.			
Vendor.	Brand.	Number of Samples.	Highest Analysis.	Lowest Analysis.	Average of Analyses.	Guaranteed Analysis.
Elder, Smith, & Co.	Bilston	3	47.80	41.20	43.43	39.30
Geo. Wils & Co...	H. & E. Alberts	2	36.70	36.70	36.70	37.00
F. H. Snow	Star Brand	1	—	—	38.80	37.00
E. H. Spicer	Thomas Phosphate	1	—	—	36.90	37.00
Norman & Co.	Scotia	1	—	—	28.20	28.00

SUPERPHOSPHATES.

Importer or Manufacturer.	Brand of Fertiliser.	Number of Samples Analysed.	Water Soluble Phosphate.				Citrate Soluble Phosphate.			
			Highest Analysis.	Lowest Analysis.	Average of Analyses.	Registered Guarantee.	Highest Analysis.	Lowest Analysis.	Average of Analyses.	Registered Guarantee.
			%	%	c/	%	%	%	%	%
Geo. Wills & Co.....	United Alkali Co.'s	9	40.38	37.40	38.36	36.00	—	—	—	—
Clutterbuck Bros.....	" "Planet"	3	39.60	37.40	38.25	36.00	—	—	—	—
S.A. Farmers' Co-operative Union	" "Globe"	3	38.10	37.76	37.88	36.00	—	—	—	—
" "	Ohlendorff's	2	37.40	37.40	37.40	36.00	—	—	—	—
Elder, Smith, & Co.	Lawes'	11	39.00	37.10	37.72	36.00	—	—	—	—
Clutterbuck Bros.....	Special	3	40.20	35.00	37.94	36.00	—	—	—	—
Australasian Implement Company	Ohlendorff's	4	37.98	36.90	37.16	36.00	—	—	—	—
" "	Shirley's	3	41.30	37.70	39.60	36.00	—	—	—	—
F. H. Snow	Sheep	5	38.50	37.80	38.00	36.00	—	—	—	—
Norman & Co.	Cross & Co.'s Reliance	2	38.60	36.00	37.30	36.00	—	—	—	—
Adelaide Chemical Works	Local make	3	41.30	33.20	37.70	33.92	—	—	—	2.68
" "	Imported	2	35.70	35.00	35.35	33.92	4.60	2.40	3.50	2.08
Gibbs, Bright, & Co.	Ohlendorff's	4	37.40	37.10	37.32	35.00	—	—	—	—
Adelaide Chemical Works	Bone Super.	1	—	—	14.85	15.05	—	—	17.03	14.65
" "	Guano Super.	4	29.00	19.60	25.20	13.00	6.30	2.60	3.57	14.00
" "	Complete Manure	1	—	—	25.10	15.50	—	—	7.00	14.75
" "	Super. B.	2	29.10	24.23	26.81	12.23	8.50	1.90	5.20	18.25
L. Mehrens & Co.	*Bone Super.	1	—	—	17.50	15.37	—	—	15.60	17.27
" "	Guano Super.	1	—	—	15.90	13.00	—	—	12.40	15.00

* Also 3.30 per cent nitrogen

BONE AND BLOOD MANURES.

Importer and Manufacturer.	Brand.	No. of Samples.	Tricalcic Phosphate.				Nitrogen.			
			Highest Analysis.	Lowest Analysis.	Average of Analysis.	Guaranteed Analysis.	Highest Analysis.	Lowest Analysis.	Average of Analysis.	Guaranteed Analysis.
			%	%	%	%	%	%	%	%
Adelaide Chemical Works	Bonedust	1	—	—	47.40	45.03	—	—	4.20	2.14
L. Mehrtens & Co.	"	1	—	—	43.60	43.77	—	—	4.60	4.23
"	Bone Manure	1	—	—	18.10	11.13	—	—	4.10	4.35
"	Dried Blood	1	—	—	—	—	—	—	11.90	11.94
Crompton & Son	Bonedust	2	48.00	47.10	47.55	46.50	3.90	3.91	3.90	3.90
Geo. Wills & Co.	Calcutta Bonedust	3	54.70	50.70	52.77	50.00	3.80	3.70	3.73	3.25
A. R. B. Lucas & Co.	Bally Bonedust, No. 3	2	54.81	52.33	53.60	52.00	3.90	3.82	3.92	3.50
"	" No. 4	2	50.70	50.65	50.68	52.00	3.74	3.50	3.62	3.50
"	" No. 5	2	40.34	39.73	40.04	40.00	3.11	2.88	3.00	2.80
J. C. Rawoldt & Son	Champion Bonedust	1	—	—	51.30	45.00	—	—	3.80	3.50
C. F. H. Stockmann	Bonedust	1	—	—	46.50	47.15	—	—	3.90	4.02
E. Anders & Sons	Victor Bonedust	1	—	—	43.70	42.10	—	—	4.40	3.00
H. Oertel	Bonedust	1	—	—	41.40	40.00	—	—	2.40	2.00
L. Conrad	Bonedust	3	48.70	41.00	43.90	48.46	4.00	3.50	3.53	3.57
"	" 1A	2	36.90	35.80	36.35	—	3.80	3.00	3.40	—
Adelaide Chemical Works	Bone Manure	1	—	—	27.90	21.05	—	—	1.60	2.10
Excelsior Manure Co.	Bonedust	—	—	—	—	—	—	—	—	—
"	Farmers' Fertiliser	1	—	—	33.60	30.10	—	—	2.80	2.00

SOME MANURE EXPERIMENTS IN CANADA.

The Annual Reports of the Canadian Experimental Farms for 1900 contain a mass of information concerning the use of fertilisers for cereals, a few notices of which will be instructive to our cultivators, notwithstanding the different climatic conditions. At the Ottawa Farm these experiments have been carried on for twelve years, the land used being a sandy loam more or less mixed with clay, which was originally covered with heavy timber. As a result of these trials it has been shown that barnyard manure (mixed horse and cow manure) can be most economically used in the fresh or unrotted condition. Ton for ton its producing power appears equal to rotted manure, which loses during the rotting about 60 per cent. of its weight. At the time the experiments were started it was the general opinion that finely-ground untreated rock phosphate was a valuable fertiliser, but ten years' experience showed that unless treated with sulphuric acid it was of no value as a fertiliser. These conclusions, however, are different to those arrived at in connection with experiments elsewhere, and it would appear to have some distinct value in soil well supplied with humus. The use of sulphate of iron has proven to be almost useless for producing an increased crop, though highly recommended at one time by a high authority. Common salt has been shown to be a most valuable agent for producing an increased crop of barley, and of much less value for spring wheat or oats. Gypsum has similarly proved of use on barley crops, but of little value for wheat or oats.

After constant cropping for ten or eleven years, it was found that the soil in the plots receiving no farmyard manure were much depleted of humus, and hence less capable of holding moisture, and, apart from the question of plant food, less favorable for the growth of plants. To rectify this various green crops were sown and ploughed under, and other treatment given to restore the humus.

Another question being tested was the length of time liberal applications of barnyard manure on the soil would continue to affect the subsequent crops put in without manure. Nothing definite on this point is yet determined, as only two crops have been grown since. The use of mineral super. alone, at rate of 500lbs. per acre, does not appear to have a marked effect on wheat; but, contrary to what might be expected, the continued application year after year of an incomplete fertiliser like super does not appear to have resulted in smaller returns. The average yield of this plot for the first ten years was 11 bush. 48 $\frac{1}{2}$ lbs. per acre; for the thirteenth year (the second crop put in without additional manure), the yield was 11 bush. 55 lbs. per acre. Another plot receiving the same treatment shows the same general results, but the returns are somewhat better, the ten years' average being 12 bush. 33 $\frac{1}{2}$ lbs., and the thirteenth crop 14 bush. 40 lbs. The average for thirteen years of the two plots manured with super. is only 2 bush. above the average of the two unmanured plots. In the tests with oats and barley the results have been somewhat similar, though the yields all round are higher, and the super has been more profitable. With the returns from oats the extra yield averaged about 9 bush., and with barley about 6 bush., more per acre than the average of the unmanured plots.

Right through the whole series of experiments the application of 15 tons per acre of farmyard manure has given the best return.

EGG-STEALING DOGS.—Blow out the contents of an egg, fill up with ammonia, seal with beeswax, cleanse the outside of the shell, place in the nest with a good sound egg, and await developments. If that dog steals another egg nothing but death will cure him of the habit.

FARM HINTS FOR JUNE.

BY THE EDITOR.

Except, perhaps, in the South-East, all cereal crops should have been sown now; and it will, in many cases, pay well to run harrows over the fields where the earliest sown crops have started growth. A few of the plants may possibly be uprooted, but the opening of the caked surface will allow air and warmth to penetrate, and the plants will make great progress. Moisture rapidly escapes from a caked surface. Rolling often proves to be beneficial, but a light harrowing should always follow. These operations cause the plants to develop roots and to tiller or stool.

Directly the cereal crops in the whole strength of the farm should be put on to fallowing; but if the ground is boggy or so wet that the land turns up in clods it will be necessary to wait until it becomes mellow. The earlier that fallowing is done the better, for if turned up too late the land does not settle down, and a hollow seed bed is the result. The evil of this is not seen until some time after the land is seeded. At first the plant will be more than ordinarily vigorous in many cases, but when dry hot weather occurs they will wither and blight. A loose surface and a firm subsoil is the ideal seed bed for cereals.

Sow mustard on well-tilled levelled soil in drills 20in. to 30in. apart; thin to 9in. or 10in. when the plants are 8in. high, and keep the plot free from weeds. When the seed is ripe the crop must be gathered promptly. If White mustard is grown the seed will be ripe when of a bright yellow color. If Brown mustard is grown the seed will be darkish brown when ready to harvest. It will require a cloth in the body of the wagon when the seed tops are cut with a sickle and thrown in and trodden down. The load must be carried to a hard clean floor, spread out to dry for a short time, and then thrashed and winnowed till quite clean. Then bag up and send to market. There is an advertisement in this issue making liberal offers for mustard seed.

Where pits can be made for ensilage of fodder it will be most advantageous to use pits, because they save more fodder, last longer, and are safer against fire and other accidents. Sour silage is best for cows, and probably also for dry stock. Sweet silage is dry; therefore there is more solid matter in a ton of sweet silage than in the same weight of sour silage, but the latter is more readily digested. The farmer who would succeed must provide for ensilage, because his stock must have a fair quantity of succulent food during the autumn and early winter. Even if he grows maize, sorghum, mangolds, kail, and pumpkins or melons, he still requires silage. Preparations for ensilage should begin now, and be completed just before haytime. Vetches and peas should be drilled on to the cereal crop that has been sown for ensilage.

For mangolds, beets, rape, kail, or cabbage, the soil must be deep, rich, and well prepared in order to get the best results. Land should be got ready at once for these crops. Seeds of mangolds and beets may be sown from July till end of September, or even later in some places. They will thrive in a saline soil, or one that is not saline; but salt is good for them. It is best to drill in the seeds at 30in. apart for the largest sorts, and 24in. for the smaller kinds, thinning the plants to 15in. or 10in. in the rows, according to size of roots. It is necessary to single the plants, because more than one seed is contained in each capsule. The hoe should be frequently used between the rows and plants, not only to destroy weeds, but also to keep the surface open and to allow the air to enter.

Begin to plant Jersey kail, cow cabbage, Thousand-headed kail, and other large varieties for cattle feeding. Plant in rows 6ft. x 4ft. apart. Clay soils heavily manured and thoroughly tilled will suit these crops, but they need

plenty of hoeing whilst growing. Lighter soils will also give good results when plenty of manure is worked in to a good depth.

It is generally possible to select a few acres of good deep soil near the home-stead, and it will always pay well to deeply plough and heavily manure from ten to twenty acres for the purpose of growing a few vegetables for the house, and some greenstuff for the fowls, pigs, cows, and horses. In growing vegetables do not grow too large a bulk of any sort to mature all at once. Sow small plots, and sow at intervals.

There is everything to be gained and nothing to lose from planting numbers of forest trees. Single rows of trees are not likely to thrive. They must be planted thickly, so that they may shelter and nurse each other until established. Six feet apart is best, and when the trees have reached 10ft. in height remove each alternate tree. Five rows along the margin of the land would give good results. They should be planted so that the rows should be broken—that is, counting from the fence across the row, there would be five, then four, then five again, and so on. The next best plan is to plant in clumps. Where limestone prevails do not plant red gums—indeed, they grow best on rather swampy land. The most generally suited trees are sugar gums, as they appear to thrive almost anywhere. June and July are the proper months for planting forest trees. Of pines the hardiest is probably the Aleppo (*Pinus halepensis*), and this will also grow on sandy soils, where the Maritime pine (*P. maritima*) is well suited.

Either field or garden peas should be sown in drills 3ft. apart. Two bushels of seed will sow an acre if drilled. It is a good plan to put in a few broad beans, as these serve as supports for the peas. Broad beans could also be sown in drills for feeding horses or pigs. Use superphosphate as a manure. The main crop should be sown in July and August in the later districts. Carrots and parsnips are valuable food for horses and cows. Deep light soil that has been manured well for a previous crop is most suitable, and should be well tilled. Six pounds of seed of either is enough for an acre, drilled in rows 30in. apart, thinned to 4in. Seeds of carrot should be rubbed between the hands with sand to remove the bristle.

Towards the end of this month the boars and sows may run together, as the warm weather will come on about farrowing time. The Berkshire boar is best to mate with any well-made sow.

Sainfoin, Bokhara clover, Sulla (*Hedysarum coronarium*, also called Malta clover), and Broadleaf mustard have all been proved to produce good heavy crops of fodder, and should be grown by many farmers. Sulla, Sainfoin, and Bokhara clover are more likely to give satisfaction northwards from Adelaide than is *Paspalum dilatatum*. The latter, however, if planted from roots, might do well in the hilly districts and South-East, where, however, many other fodder plants can be propagated with satisfactory results from seeds.

THICK AND THIN SEEDING OF WHEAT.

BY FREDK. COLEMAN.

Very much has been written upon the merits of thin seeding. Alderman Mechi, of Tiptree Hall, Essex, has been quoted in support of the practice, and the increased tillering of thinly-sown wheat is claimed by some to result in a greater yield.

J. J. Mechi got heavy crops from very thin seeding indeed; but under his system of irrigation with liquid manure, with every acre tile-drained, might he not have got even heavier crops under average seeding? Professor J. Wrightson, of Downton, says:—"On good land early in the season the smallest quantities of seed may be used, i.e., about 6 pecks. On poor land and late the

largest amounts of seed are required, *i.e.*, from 12 pecks to 16 pecks. Anything less than 6 pecks per acre must be looked upon as exceptional." An English farmer, in a letter to me some months ago, said he averaged from 50 bush. to 60 bush. of 60 lbs. of wheat per acre, and sowed 200 lbs. per acre. The conditions here are, of course, very different; but I noticed crops last season that were, I think, too thinly sown, including my own—58 lbs. drilled to 62 lbs. later.

In an interesting paper by Mr. A. L. McEwin, read before the Brinkworth Bureau, the writer says:—"All would admit that fourteen to sixteen plants on a piece of land 1 ft. x 1 ft. were far too many." I, for one, do not admit it. Take a piece of paper 1 ft. square, draw parallel lines, 3 in. apart each way, beginning $1\frac{1}{2}$ in. from the edges; we get sixteen points where the lines cross. A seed at each such point would have nine square inches of surface; with a fairly strong deep soil in good heart and tilth this, in my opinion, is not too thick. Again, I estimate that a bushel of ordinary size seed wheat per acre would allow 12 grains per square foot, and not 16 grains, as Mr. McEwin states. From actual count of some ounces of clean plump large-berried wheat, I found it would take 7,070 grains to the pound and, with good average size seed wheat, there were 8,806 grains to the pound, or 528,414 to the bushel (60 lbs.), this gives 11.8 sq. in. to each grain, or 12.2 grains to square foot; not half Mr. Dall's estimate. But we all know that a somewhat uncertain percentage of even apparently uncracked grain, when stripper-reaped, will not grow. Pickling, again, often perceptibly affects germination, as also do some fertilisers, so that Prof. Lowrie's 65 lbs. per acre (when at the college, last September, I understood him to say he had drilled in 65 lbs. per acre, not $1\frac{1}{2}$ bush., as Mr. McEwin says; but I may have misunderstood) seems to me not a bit too thick for safety. Some few years ago I made a careful experiment in "thick and thin" sowing. I do not claim for the results of one such experiment any great importance, but it has some value, as well as interest. The ground was rather light and had carried peas the previous year:—

Weight of Seed per Acre.			Distance Apart in Inches.	Area for Each Plant.	Average Number of Heads per Plant.	Best Plant.		Yield per Acre.	
						Heads.	Grains.		
Bush.	Lbs.	Ozs.		Sq. Ins.				Bush.	Lbs.
No. 1 WHEAT.									
1	19	0	3	9	3.43	6	156	49	14
	19	12	6	36	8.22	14	462	37	30
	8	12	9	81	12.5	19	627	25	33
	5	0	12	144	16.0	38	1,254	18	15
	3	3	15	225	19.21	33	1,089	14	1
	2	4	18	324	29.94	41	1,353	15	19
No. 2 WHEAT.									
1	38	7	3	9	2.5	4	168	109	0
	24	11	6	36	4.25	7	336	52	48
	11	0	9	81	6.0	9	609	48	36
	6	3	12	144	6.58	11	788	31	30
	4	0	15	225	9.7	15	1,158	35	42

No. 1 wheat had a medium-size head and very even all through, averaging thirty-three grains. This wheat tillered well, while No. 2 tillered out poorly, but had very fine heads, giving, from 3 in. apart upwards, 42, 48, 67, 71, and 77 grains per head respectively. It will be seen that this wheat at 15 in. apart each way would have to yield twenty-five times as much per plant as at 3 in. apart to return the same quantity per acre, and this is where the thin seeding fails in giving the better result.

In "Notes on Wheat at Wagga Farm," Mr. W. Farrer, in the May number of the *Agricultural Gazette* (N.S.W.), says, "A new wheat 'Nutcut,' at Dookie, yielded with 16 sq. in. for each plant at the rate of 29bush. 42lbs., and with 144 sq. in. only 14bush."

Square inches to plant.....	16	48	80	112	144
	bush. lbs.	bush. lbs.	bush. lbs.	bush. lbs.	bush. lbs.
Yield in bushels and pounds	29 42	28 4	19 58	15 40	14 3 $\frac{1}{2}$

A bushel per acre would, I suppose, give about 16 sq. in. for each plant, and a third of a bushel would allow 48 sq. in.; the difference is not so marked as in my trial.

I am drilling now (May 20) at the rate of 39qtrs. (78lbs.) per acre. Unfortunately, due to the dry weather, hardly any even of the earliest sown is above ground. Mr. Farrer, I see, advises 70lbs. to 90lbs. per acre as the safest.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of May, 1901:—

Adelaide	1·07	Hoyleton	0·34	Macclesfield	1·50
Hawker	0·02	Balaklava	0·72	Meadows	1·69
Cradock	—	Port Wakefield	1·50	Strathalbyn	1·43
Wilson	0·02	Saddledworth	0·65	Callington	0·71
Gordon	—	Marrabel	0·42	Langhorne's Bridge..	0·91
Port Germein	0·21	Riverton	0·60	Milang	1·02
Port Pirie	0·19	Tarlee	0·61	Wallaroo	0·63
Crystal Brook	0·38	Stockport	0·39	Kadina	0·95
Port Broughton	0·30	Hamley Bridge	0·82	Moonta	1·33
Bute	0·80	Kapunda	0·78	Green's Plains	0·61
Hammond	0·05	Freeling	0·86	Maitland	1·30
Bruce	0·05	Stockwell	0·40	Ardrossan	0·89
Wilmington	0·62	Nuriootpa	0·50	Port Victoria	0·71
Melrose	0·26	Angaston	0·44	Curramulka	1·08
Booleroo Centre	0·13	Tanunda	0·82	Minlaton	0·84
Wirrabara	0·39	Lyndoch	0·67	Stansbury	0·60
Appila	0·35	Mallala	0·34	Warooka	1·23
Laura	0·42	Roseworthy	0·78	Yorke town	1·08
Caltowie	0·11	Gawler	0·90	Edithburgh	0·64
Jamestown	0·38	Smithfield	0·43	Fowler's Bay	1·22
Gladstone	0·30	Two Wells	0·58	Streaky Bay	1·23
Georgetown	0·58	Virginia	0·80	Port Elliot	1·61
Narridy	0·38	Salisbury	1·02	Port Lincoln	1·93
Redhill	0·39	Teatree Gully	1·50	Cowell	1·33
Koolunga	0·41	Magill	1·16	Queenscliffe	0·60
Carrieton	—	Mitcham	1·01	Port Elliot	1·58
Eurelia	0·03	Crafers	1·90	Goolwa	1·49
Black Rock	0·04	Clarendon	1·23	Moningie	1·46
Orroroo	0·05	Morphett Vale	0·91	Kingston	1·76
Johnburgh	—	Noarlunga	0·86	Robe	0·81
Petersburg	0·11	Willunga	0·88	Beachport	1·69
Yongala	0·08	Aldinga	0·75	Bordertown	0·73
Terowie	0·12	Normanville	0·71	Wolsley	0·45
Yarcowie	0·11	Yankalilla	1·19	Frances	1·11
Hallett	0·26	Eudunda	0·30	Naracoorte	1·37
Mount Bryan	—	Truro	0·46	Lucindale	1·92
Burra	0·30	Mount Pleasant	1·07	Penola	1·40
Snowtown	0·65	Blumberg	0·88	Millicent	2·73
Brinkworth	0·56	Gumeracha	1·44	Mount Gambier	2·41
Blyth	0·56	Lobethal	1·51	Wellington	0·95
Clare	0·53	Woodside	1·61	Murray Bridge	1·05
Mintaro Central	0·37	Hahndorf	1·96	Mannum	0·48
Watervale	0·79	Nairne	1·25	Morgan	0·17
Auburn	0·44	Mount Barker	1·44	Overland Corner	0·19
Manoora	0·47	Echunga	1·66	Benmark	0·01

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report :—

June 1, 1901.

The dire need of rain when last we wrote unfortunately continued until the 24th before a break in the weather occurred, meanwhile doing such harm as to spoil the season for winter stock feed. The change in atmospheric conditions when it did come unfortunately brought but little relief to districts most in need of moisture, the fall being confined chiefly to the coastal agricultural areas. Lambs have died off in every direction, even on many of the most favored estates, so that the season's increase is a poor one. Dairy folk have been forced to dry off most of their herds, as a bad winter is now on for their cattle, though in a few places of course conditions are better, and producers are satisfied, owing to the high figures being obtained for produce. Reports from the outside pastoral country north and west are generally favorable, and in the North-East prospects have slightly improved.

The less favorable outlook in the country is preventing a recovery in city trade, so that dulness continues in commercial circles. A steady development in mining for copper is evidently meeting with success in some directions, but the fall in value of lead, which now seems to be established, will, it is feared, result in the further lessening of demand for labor on the Barrier mines.

Several vessels arriving here at about the same time, having been chartered earlier to load with breadstuffs, caused a temporary activity in the wheat market. The continuance of dry weather preventing farmers completing seeding operations lessened deliveries, and possibly caused some holders to advance their ideas of value; but as soon as the pressing demand is satisfied dulness is again expected, as values here are now higher than European rates will justify. An Australian cargo just reaching London as we write has been placed at 29s. 4½d. per quarter, but forward business is reported by cable at up to 30s. The crops generally in Europe look very promising, so that Continental holders are freely delivering in Great Britain, whilst America is looking forward to a bountiful wheat harvest; in fact, a record yield is predicted by some authorities. The Americans are also cutting into the South African trade, and supplying portions of the West Coast of South America where importing breadstuffs. There is no export trade in flour doing from here worth mentioning, and local business is confined mostly to supplying bakers' season contracts. Bran and pollard have had exceedingly brisk business during the month, but at moment are weak at quotations. Feeding grains nominally unchanged, but stocks are much lighter, as a result of increased demand owing to dearth of growing feed. Hay and chaff are also quoted higher, but trade is confined to filling local demand.

The course of trade in potatoes during the month has been somewhat unusual. Values at Mount Gambier improved, although price for the superior quality Tasmanians eased down. The exhaustion of supplies in our South-East districts will probably account for what at least appears an anomaly. Heavy shipments of New Zealand are arriving, and it is certain we must look outside our own State for the bulk of our supplies during next few months. Onions have been bounding upward in price, and now reached a figure that must materially restrict their consumption.

We continue dependent upon importations of butter to supply the bulk of our wants. Fortunately for consumers here, values in New Zealand did not, as appeared for a time probable, follow the extreme rise shown in Victorian rates, the latter market having to recede. This movement caused an immediate increase in forwardings of cream overland, so that whilst New Zealand kept this market filled with bulk and ordinary grades, the demand for new frosh was also supplied. Brisk business in eggs during the month at very satisfactory advancing prices can be reported. Supplies of local cheese are altogether insufficient for trade wants, so that in this also we are relying upon New Zealand for increasing quantities. Heavy demand for bacon, but the output is about sufficient for home requirements, though there is nothing to spare to meet inquiries for export trade. Honey shows but slight improvement in value, though demand has been much better. Beeswax scarce. The supply of almonds very short of demand. Carcass pork and veal ruled a shade lower, though active bidding is experienced for all coming forward. A heavy month's business in live and dressed poultry can be reported; a slight excess in supply of poor birds at two or three sales caused inferior to drag a bit, but everything fit for table that was penned found ready buyers at very satisfactory prices; turkeys only selling irregularly, but still averaging fair prices.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide, 2s. 9d.; outports, 2s. 7d. to 2s. 8d. per bushel of 60lbs.

Flour.—City brands, £6 to £6 5s.; country, £5 17s. 6d. to £6 per ton of 2,000lbs.

Bran and Pollard.—11½d. per bushel of 20lbs.

Oats.—Local Algerian and dun, 1s. 9d. to 2s.; prime stout feeding, up to 3s. per bushel of 40lbs.

Barley. Malting, 3s. 3d. to 3s. 9d.; Cape, nominal at 2s. 3d. per bushel of 50lbs.

Chaff.—£3 to £3 5s. per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.

Potatoes.—Gambiers, £5 ; Tasmanians, £5 2s. 6d. per 2,240lbs.
 Onions.—Locals, £11 to £12 ; Gambiers, £12 10s. per 2,240lbs.
 Butter.—Creamery and factory prints, 1s. 4d. to 1s. 7d. ; private separator and best dairy, 1s. 2½d. to 1s. 4½d. ; good store and collectors', 1s. 0½d. to 1s. 1½d. ; N.Z. bulk, 1s. 1d. to 1s. 2½d. per pound.
 Cheese.—S.A. factory and N.Z., 9d. to 10½d. per pound.
 Bacon.—Factory-cured sides, 7d. to 7½d. ; farm lots, 6d. to 6½d. per pound.
 Hams.—S.A. factory, 8d. to 8½d. per pound.
 Eggs.—Loose, 1s. 5d. ; in casks, f.o.b., 1s. 7d. per dozen.
 Lard.—In bladders, 7½d. ; tins, 6½d. per pound.
 Honey.—Up to 2½d. for best extracted, in 60lb. tins ; beeswax, 1s. 1d. per pound.
 Almonds.—Soft shells, 6d. to 6½d. ; kernels, 1s. 2d. per pound.
 Gum.—Best clear wattle, 2d. per pound.
 Dressed Poultry.—Turkeys, 6½d. to 7½d. ; fowls, 5d. to 6d. per pound.
 Carcass Meat.—Good shop porkers, 4½d. to 5d. ; baconers, 4d. to 4½d. ; poor, coarse, and heavy, from 3d. to 4d. ; vealers, 2d. to 3½d. per pound, according to quality.
 Live Poultry.—Good roosters fetch from 1s. 7d. to 2s. each, prime heavy, up to 2s. 6d. ; good hens and fair cockerels, 1s. 3d. to 1s. 6d. ; medium sorts, 10d. to 1s. ; weedy birds and chicks, 8d. to 10d. ; ducks, from 1s. 1½d. to 2s. 3d. ; prime heavy, up to 2s. 8d. ; geese, 3s. to 3s. 6d. ; pigeons, 5½d. ; turkeys, 4½d. to 5½d. per pound, live weight, for fair to good table birds.
 Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

WEATHER AND CROP REPORTS.

Since the receipt of most of the following reports good rains have fallen over the localities mentioned, excepting those in the Northern and Far Northern areas.

BAKARA (May 24).—The weather has been very warm and dry. Seeding operations are completed. In parts of the district feed is plentiful. Stock in fair condition.

BALAKLAVA (May 21).—Farmers are anxiously looking for a good fall of rain, as no serviceable rain has fallen since April 2, and most of the wheat is coming up in patches. Some have finished seeding, and others have stopped until rain comes. The bulk of the wheat here is being put in with super., which has been hard to get until lately. There is practically no green feed, as what had started has nearly died off again, and the outlook for lambs is dull. There is a fair amount of dry feed yet, and stock are in fair condition.

BOULEROO SOUTH (May 17).—It is still keeping very dry. Seeding has in some cases come to a standstill, for the soil is too hard to work. The ewes with lambs have hard times, for there is no green grass; the lambs are, however, doing fairly well for the season. Rainfall for year to date 1.06in.

CARRINGTON (May 22).—There has been but little change in the weather since last report. People are getting very anxious about the future season, as feed is getting quite scarce, and in some parts it has gone off altogether. Some farmers have killed their lambs to save the ewes.

CRYSTAL BROOK (May 27).—The rainfall for the past four weeks has been light, and very little wheat is up. It is feared that a lot of seed has malted, and the probability is that some farmers will have to sow over again. Others have been delayed with ploughing. A good rain is badly needed.

LUCINDALE.—A dry month ; a few light scattered showers fell, with dewy nights. At the end of the month a nice steady rain fell which will do the young feed and crops a lot of good. A few lambs are already to be seen. Foxes have also been seen. Stock in splendid condition.

MILLICENT (May 18).—So far the weather this month has been all that could be desired—mild, even warm days, with a few showery, heavy dews, but no frost to hurt. Potatoes have turned out fairly well. Early crops coming on well, but ploughing still going on. All stock looking well. Butter and eggs scarce ; and milk supplies at factories very small.

MOUNT BRYAN EAST (May 21).—Seeding nearly over. Keeping very dry, and rain badly wanted.

MOUNT REMARKABLE (May 16).—Since last report no rain of any importance has fallen ; consequently seeding is almost at a standstill, and unless rain soon falls the season will be one of the driest on record. Feed is scarce. Stock getting poor except in favored localities.

NANTAWARRA (May 27).—Stock are suffering from the want of green feed. Although some started with the April rains, but owing to hot dry weather it has gone off. Ewes with lambs are getting very low. Wheat drilled in about a month ago is up in many places, while in other cases malting is feared. Rain fell yesterday and continuous to-day which will help the paddocks, but a good downpour is wanted. Seeding is about finished.

PINE FOREST (May 20).—More rain is required. Some farmers have finished seeding, but with others the ground is too hard and dry to do the work satisfactorily. Bad times for sheep are certain, as feed is very scarce. All other stock are being fed by hand, and unless rain falls soon great expense will be incurred to keep them alive.

PORT GERMEIN (May 23).—Good rains fell at the beginning of the month, which started most of the feed and wheat; but owing to very hot weather the wheat has been checked. About $\frac{1}{2}$ in. of rain fell lately, but a heavier downfall is anxiously looked for. Stock in fair condition; several cows have died from impaction. The lambing will be very poor owing to scarcity of green feed and depredations of eagles, which are numerous.

PORT PIRIE (May 31).—Weather very dry through May; a few light showers in last week, but of little value to crops or grass, which are going off and dying. The country generally looking much barer than at the beginning of the month. Change anxiously looked for.

RED HILL (May 27).—There has not been enough rain to make the grass grow. Seeding is nearly finished. Most of the wheat has been sown on dry ground. A little of the early sown is up, and in some places very patchy. Rain is badly wanted, as feed is getting scarce. There have been some sharp frosts.

RIVERTON (May 26).—The continued dry weather is injuring the early-sown crops, and it is feared that some of the wheat has already malted. Rain is urgently required. Many farmers have not yet sown. There are now indications of rain.

SADDLEWORTH (May 20).—Seeding well forward, most fallow being drilled in good order; extremely dry. Green feed started by the light rains six weeks ago is drying up again. It is a most trying season for lambing ewes; there seems little hope of saving both ewes and lambs. Outlook for feed very gloomy. Sky now overcast; may the much-needed rains come! Rain-fall for year to date, 2.41 in.

STANBURY (May 23).—This month has been very dry here and seeding operations are at a standstill. Those who have sown are now complaining about malting. The outlook is discouraging.

WATERSVALE.—Rain is badly needed. Some farmers are afraid of the crops malting, while some cannot go on with ploughing.

WILSON (May 23).—Weather dry, cold and frosty nights. No sign of rain. No green feed to be seen anywhere. Stock have to be removed from the district or hand fed.

YORKTOWN.—Weather keeping very warm and dry.

MISCELLANEOUS NOTES.

CLEANING PLOUGHS.—A good plan for cleaning the plough, which will also work well on other tools of iron or steel, is as follows:—Slowly add 1 pt. of sulphuric acid to 1 qt. of water, handling it carefully and stirring slowly, as considerable heat will result from the mixing. When cool, moisten the surface of the metal with this, and then rub dry, after which wash off with pure water. This application should clean any surface not too badly rusted; but if the tool has been long neglected it may require more than one application. After cleaning, a thorough coating of grease is given before putting a tool away, and when taken out to use give another greasing, and it will go one horse easier. Not only is it much easier for the team, but for the ploughman also.

PREVENTING HILLSIDE WASHES.—Hillside ground sometimes washes very badly during heavy storms. Small rivulets start at the top, and, having an unimpeded course, form gullies. The water during every ensuing storm follows these cuts, finally forming such large washouts that the field may be almost ruined. An American farmer says the remedy is to check the flow of water and divide it up into small quantities. With a plough make small ditches around or alongside of the hill. A single furrow is sufficient. Turn the furrow to the lower side. Do this every 40 ft. and allow just sufficient fall to carry off the water. The less fall the better, as it allows the *debris* to settle in the dams. Wherever the furrows cross the gullies, make dams of small brush, tamping it solid. Do not use rocks. Nothing will do as well as brush. In the spring the furrows and dams will be level full of sand and *debris*. This will not only prevent washing, but if continued for several years, making the dams and ditches each year in different places, it will turn an unsightly field into a smooth one.

AGRICULTURAL BUREAU BRANCH CONFERENCES.

SOUTH-EASTERN BRANCHES, AT PENOLA.

The ninth annual Conference of South-Eastern Branches of the Agricultural Bureau of South Australia was holden for the second time at Penola on March 1st, 1901, with Mr. E. A. Stoney, of Penola Branch, in the chair. The attendance of members of the other branches was diminished considerably through a sudden resolution to postpone the Conference, which was to have been holden a week previously. Still there was a large contingent of visitors, which partly made up for the absence of members of various Branches.

Branches Represented.

Penola: Messrs. J. D. Wilson, H. Ricketts, D. McKay, S. W. Peake, W. Miller, Dr. F. Ockley, W. P. Davis, J. T. Morris, S. B. Worthington, R. Rymill, J. W. Sandiford, and R. Fowler. Mount Gambier: Messrs. J. C. Ruwoldt and W. Barrows. Millicent: Messrs. R. Campbell, H. A. Steward, J. Davidson, and B. Varcoe. Tatiara: Mr. W. E. Fisher. Naracoorte: Messrs. E. R. Peake, J. Wynes, S. Schinkel, A. Caldwell, A. Johnstone, H. Hassler, and eleven students from the Naracoorte Agricultural School. Central Bureau: The General Secretary and Mr. George Quinn, Horticultural Instructor.

Exhibits.

Tables the whole length of the hall and platforms at the end were loaded with splendid exhibits of horticultural products, and these would have been even considerably more numerous had not the Conference been suddenly postponed from a week previously. The apples and pears were simply perfection personified. The collection of thirty varieties from Coonawarra Fruit Colony, staged by Mr. J. A. Riddoch, could not possibly be excelled. From Mr. John Riddoch's Yallum estate came twenty-four varieties of apples, fifteen of pears, several varieties of grapes, quinces, lemons, damsons, filberts, walnuts, co-nuts, medlars, cucumbers, and a large number of vegetables. Mr. J. D. Wilson staged eight varieties of grapes, piemelons, quinces, pears, figs, tomatoes, apples, onions, &c. Mr. D. McKay brought in two varieties of pears and one of apples. Mr. Simpson, several section boxes of honey. Mr. E. A. Stoney, some dried plums, raisins, grapes, lemons, and almonds. Mr. Ricketts staged five sorts of apples, quinces, some roots of *Paspalum dilatatum* grass, lucern, also rye, oats, wheats, oat and wheat chaffs, piemelons, butter, and other articles. Mr. J. C. Ruwoldt, of Mount Gambier, showed six varieties of potatoes, one of which is the "North Pole," said to mature in the arctic regions within eight weeks after planting. There were a number of minor exhibits, including cheeses from the Penola factory, and a clever cage-trap for "silver-eyes," made by Mr. Warner from an idea supplied by Mr. Hart, of Millicent.

Visitors, &c.

There was a large contingent of visitors, including many ladies. Lunch and tea were provided in a room in the institute adjacent to the hall in which the meetings were held.

MORNING SESSION.

Chairman's Address.

Mr. E. A. Stoney acted as Chairman, and gave a cordial welcome to representatives of Branches and to visitors. He referred to the great advancement made in most of the agronomical industries through the existence of the Agricultural Bureau, and thought there was ample scope for further progress. The potato-growing industry in the South-East required some attention, since there had been a marked deterioration in that product of late. He referred also to the bid that was being made by New Zealand for trade in horses and produce generally, and urged South Australian farmers to take a lively interest in everything pertaining to their business. He read apologies for absence sent by a large number of persons, many of whom could have attended had the original day for meeting been adhered to. He referred in feeling terms to the loss sustained by the Bureau and district generally through the death of Mr. James Umpherston, of Mount Gambier. The first paper for consideration would be read by Mr. A. Molineux, General Secretary of the Bureau. It was written by the Chairman of the Central Bureau (Mr. F. Krichauff), and had been published in the *Journal of Agriculture* of December last, but as the writer had made one or two mistakes in it, and considered the subject of much importance to sheepfarmers in the South-East, he submitted it for their consideration. The paper was entitled, "Effect of Chemical Manuring on the Production of Wool."

[The following is a short *résumé* of the argument of the paper.—ED.]

The yolk of raw wool contains about 56 per cent. of potash, taken from the soil, and the flesh and bones of sheep exported or removed from the pastures contains a deal of nitrogen and phosphoric acid. From 1893 to 1899 there were 2,111,863,834 lbs of wool exported from Australia. There was as much nitrogen in that wool as would be found in 456,200 tons of nitrate of soda, as much potash as would be contained in 11,320 tons of muriate of potash or 45,266 tons of kainit. In 1899 there were 4,600,000 sheep killed, and in the seven years—1893 to 1899—there were 46,088,677 sheep killed and 1,009,187 lambs. The quantity of nitrogen removed in this way was as much as would be found in 298,341 tons of nitrate of soda, whilst the phosphate of lime removed in the bodies of the sheep and lambs equalled that found in 141,034 tons of Thomas phosphate. These figures showed that considerable quantities of plant-food substances were removed every year from the pastures, and the question arose as to whether it is not necessary to restore those fertilising agencies in order to maintain, if not even to increase the grazing capacity of those pastures, and at the same time improve the quality of the wool raised thereon. It was well known that the grazing of cows, where the milk is removed from the farm, will impoverish the soil, and there was certain evidence which went to prove that the nourishing quality, as well as the quantity, of herbage is increased by the application of phosphatic and other fertilisers to the soil.

Mr. Krichauff added to the above some further notes compiled from information received by the latest mail, as follows:—

Nothing can better promote the position of many of our farmers than the improvement of their grazing lands, large areas of which are very poor in their present condition. This can be accomplished by rational manuring, hitherto much neglected. Farmyard manure cannot be much used because it is in too limited supply, and does not promote the same fine nourishing herbage as mineral manures. Basic slag (or Thomas phosphate) seems to have proved itself the most effective in England and Scotland, and only in sandy and peaty lands some potash, and in specially poor grass land a small quantity of a nitrogenous manure may be of advantage.

Thomas phosphate ought to be applied before the heavy winter rains, and 5 cwt. per acre has proved to be generally profitable, and even a heavier dressing for a first application. This was shown at the Highland Agricultural Society's show at Stirling in 1900. James Morgan, of Cogar, Blairlogie, applied 5 cwt. in 1895 and 8 cwt. in 1899, at a cost of 11s. 6d. and 18s. respectively. The crop was double; the rental value was 25s. more per acre than formerly. Robert Bowie, of Coldoch, Blairdrummond, applied on a stiff clay 6 cwt. in February, 1900, at a cost of 12s., and at present has twice as many cattle on the land, the increase in the rental value being 30s. per acre more than formerly. Jas. McFarlane, of Millhall, Stirling, applied on stiff clay about 7 cwt. November, 1897, and the same November, 1898,

at a cost of 15s. 9d. each year, and had the same result as Mr. Bowie. In the "Journal of the Royal Agricultural Society of England" it is reported that Thomas phosphate has proved the most effective and durable of all the fertilisers experimented with on pastures; and Jas. Hornsby, Laxton Park, dressed all his almost worthless grassland with 5cwts., by which he converted it into useful store-grazing land. Douglas A. Gilchrist, B.Sc., obtained on clay loam the greatest profit with Thomas phosphate by applying 5cwts., and the cost of manuring had paid him interest at the rate of from 350 per cent. to 725 per cent over 1897, 1898, and 1899. It is also stated in the Gloucester County Council report that R. C. Cann Lippincot, of Almondsbury, obtained with 3cwts. a net profit of 24s. 1d. per acre over the unmanured land, and with 7cwts. per acre 41s. 11d. The hay from the unmanured pasture was taken to be of equal value, although the feeding value of the hay was much greater from the manured part. Quality and quantity combined in these and other experiments make the results with the manuring with Thomas phosphate most remarkable.

Professor Dr. Somerville states in regard to the Cockle Park experiments in sheep-feeding, that "Each year the double dressing of Thomas phosphate has produced practically double the amount of mutton. Deducting the financial results from the weights, we have a clear profit in the three years of 30s. 3d. from 5cwts. of Thomas phosphate per acre, and a pr. fit of 78s. 4d. from 10cwts. per acre. The larger dressing had much more effect on the quality than on the quantity of the herbage."

There have previously appeared in some agricultural papers in Great Britain statements that Thomas phosphate had caused injury to sheep; but sheep frequently "go wrong" where the cause is difficult to trace, and the cause ascribed is not always the correct one. Professor W. J. Malden, of the Uckfield Agricultural College, placed therefore nine Southdown tegs in three lots on pasture that had received 3cwts. Thomas phosphate and 1cwt. of sulphate of ammonia yearly for three years. On one of the plots 10cwts. per acre was used in 1900; on another 5cwts.; and on the third none. The Thomas phosphate was applied after the sheep had been put in. Two days afterwards a slight shower washed portion of the manure from the grass, but it did not wash it from the plants into the soil. The sheep could not feed without taking the Thomas phosphate. After six weeks the sheep on the plot receiving 5cwts. Thomas phosphate were 4½lbs. heavier, and those on the plot receiving 10cwts. 14lbs. heavier than those on the (in 1900) unmanured plot, and at no time were they costive or loose in the bowels, or showed the slightest sign of ill-health. A single sheep also received twice a week ½oz. during the first three weeks, 1oz. during the second three weeks, and 1½ozs. during the last three weeks, or a total quantity of 13ozs.; and while the sheep weighed on the 3rd April 3qrs. 22lbs., they weighed on June 5th 4qrs. 5lbs., and showed not the slightest sign of ill-health. A 10-weeks-old lamb was dosed in three weeks with 3½ozs. of Thomas phosphate, and gained 6½lbs. in the time. The Thomas phosphate used was one of the lower grades, which probably contain more impurities. The quantities given were such as to far exceed those when sheep are commonly feeding on pastures, and this proves that erroneous impressions have gone abroad.

Dr Ockley said a comparison could not very well be made with the old country where the rainfall is more evenly distributed and from whence most of the statistics in the paper were derived. It could not be accurately arrived at, because in England a far greater price was paid for meat, and the farmer got the manure much cheaper. Here we had to pay dearly for the phosphate and received little pay for stock in return. He doubted much if extensive artificial manuring would pay, but he advocated fostering native grasses more than was done at present.

Mr. W. E. Fisher (Tatiara) stated that he had conclusive proof as to the value of manure on the soil. A friend of his had taken up land on the share system near Olive Grove, and although he did not have exact figures with him, he was informed that the results of manuring this land were very good.

Mr. R. Campbell (Millicent) referred to some land in his district, which when burnt the first time grew a fair crop of grass, but after that only a moss. The land was now manured with bonedust and sulphate of iron, and would not only keep sheep but would fatten them. It would also grow mangolds and kale in great abundance. There had been some guano from the Naracoorte caves spread over some similar land, and on some he had he grew more mangolds on one acre of such land than on ten off unmanured.

Mr. J. Davidson (Millicent) said the paper opened up a large subject for the pastoralists to consider. He spoke from experience when he said that in some paddocks manured with phosphates the effect could be seen for many

years afterwards. He agreed with the writer, that the potash in the soil was absorbed by the animals, and that it was necessary to replace it. He was sure good results would follow the use of manure.

Mr. H. Ricketts (Penola) said in his experience it was useless to put a crop in unmanured. He also had had experience with it on grass land.

Mr. Campbell had found profit in giving charcoal, bonedust, and salt to pigs, and quoted the quantities consumed by pigs in his possession.

Mr. E. R. Peake (Naracoorte) spoke of the good results obtained from Naracoorte cave guano. A gentleman in that district put on about $\frac{1}{2}$ ton to the acre with the result that where he formerly had $\frac{3}{4}$ ton of hay he now had between 3 and 4 tons. Proof of this he could show them by visiting Naracoorte. He hoped this artificial fertiliser would come to the fore.

Mr. D. McKay (Penola) considered that if they had good grass they would have good sheep, and fat sheep were not to be despised, apart from the higher value of wool.

Mr. Davidson—Good feed and good work would depend on the manure.

Mr. Molineux referred to the necessity of supplying the element chiefly necessary for the product and keeping it renewed, as some of the elements were sure to be exhausted by pasturage.

Tuberculin Test for Tuberculosis.

In the absence of Mr. C. J. Valentine, the author of a paper on this subject (which appeared in the May issue of the *Journal of Agriculture*), the General Secretary read the same, and on its conclusion directed attention to the fact, which ought to be universally known, but unfortunately is not patent to everybody, that milk and meat of tuberculous animals can be rendered innocuous by subjecting either to proper cooking. If milk is heated to 180° Far. for ten minutes all germs of tuberculosis will be killed.

Dr. F. Ockley (Penola) thought there were several items in the paper that wanted to be obtained from the experience of the breeder, otherwise they could not be relied upon. The chief question was whether tuberculin would cultivate tuberculosis in a healthy cow; also whether it would give the animal perfect immunity from the disease? If the latter were the case, it would be a good thing, but both questions remained to be proved. Vaccination was done with vaccine from the udder of the cow, and was unlike the tuberculin test, which was done with prepared substance. As they all knew and believed vaccination thoroughly immuned the patient from the disease.

Mr. S. Schinckel (Naracoorte) said the tuberculin had been injected into all his cattle, and none contracted the disease. He did not think it did the cattle any harm, and was strongly in favor of it.

Mr. J. Davidson did not think there was any evidence to show whether the inoculation with the tuberculin test was harmful; and on the other hand it had proved to be effective in Denmark.

The General Secretary said that if properly applied it was evident that tuberculin told whether the cattle were affected with tuberculosis or not. He did not believe the test caused the disease. As scientists differed from the outside world, they would have to give the former the preference of belief. In all reforms scientists took the lead, and he believed it was so in this case. It was not claimed that tuberculin rendered cattle immune from tubercular disease, but when properly applied it showed whether or not the animal was affected by tuberculosis.

Mr. D. McKay considered it was most dangerous to inject a poison, which he believed the tuberculin was, into a healthy cow.

The Conference then rose for lunch.

AFTERNOON SESSION.

Agricultural Education in State Schools.

Mr. H. Hassler, teacher of Naracoorte Public School, read the following paper :—

It has always been justly complained of that in this country children leave school at too young an age, before they can have had time to properly assimilate the knowledge they have acquired, with the result that they soon forget a great part of the little they have learnt.

In nearly all the countries of Europe there exists a system of secondary education, which has been organised with reference to the careers which the children are likely subsequently to follow; and, in order to meet the demand now so persistently urged for secondary and technical education, the South Australian Government has, in suitable centres, established schools and classes in which the youth of the country are fitted for their work in after life, especially those on whose work depends the material welfare of the community—artisans, merchants, and farmers.

We are a farming community, and the prosperity of our country is depending upon the tiller of the soil. What was wanted, therefore, was to train the minds of the young farmers and those who ultimately intend to follow these pursuits, to give them a thirst for inquiry, a sense of accuracy, and of the certainty of natural laws. With this object in view the Government have at Roseworthy established an agricultural college, an agricultural school at Adelaide, and agricultural classes at Naracoorte, Jamestown, and Clare.

The object of the agricultural college is twofold: To train young men for the practice of agriculture, horticulture, and viticulture, and to conduct experiments with a view to the advancement of the rural industries in South Australia. To qualify for admission, the candidate must be at least fifteen years of age, and must have gained the certificate of compulsory standard, or must have passed an examination equivalent to it. The curriculum at the college comprises mathematics, physics, chemistry, surveying, bookkeeping, agriculture, fruit and viticulture, oenology, wool-classing, and veterinary science. Besides these subjects, the lectures of which extend over a course of three years, the students are required to take part in the various operations and the work of the farm, and they are also trained in the use of tools, and taught such wood and iron working as are calculated to be useful on a farm.

But it is not so much the agricultural college as the benefits derived from the agricultural classes to which I wish to draw special attention. The former is within reach of comparatively only a favored few, because only a limited number is admitted to that institution every year, and not every father can afford sending his son there for three years; but the latter are open to an unlimited number of pupils, girls as well as boys; and although the girls do not take part in any outdoor work, yet by attending the classes they gain advantages which will be of lasting benefit to them.

A fuller system of education than that which has hitherto been in our schools has been found to be absolutely necessary. South Australia depends so much on agricultural and horticultural pursuits that the greatest attention must be given to equip the boys, so that in years to come they may be able to carry on the cultivation of the staple products of the country with advantage not only to themselves, but also to the country generally. It is noticeable that those countries of the world which devote most attention to technical education are foremost in agricultural and industrial pursuits.

However, it must not be inferred that these classes are of benefit to those boys only who intend becoming farmers, orchardists, or vignerons; the fact that girls are admitted also proves conclusively that the subjects which are comprised in the curriculum are of benefit to all, without reference to a particular trade or calling.

The agricultural classes are in connection with the public schools at those towns in which they are established. They are in charge of teachers specially trained and instructed for the work, and the school hours are the same as those in a public school. To these boys and girls are admitted who are over thirteen years of age, and those over twelve years who have obtained their compulsory certificate. The fee is only a nominal one—one shilling per week—and the cost of books and material is only trifling.

The curriculum is, with the exception of languages, almost identical with that taught at higher colleges. Foremost stands English language and composition, which is not only valuable as a medium for literary culture, but it is also technical, in so far as it leads to the accurate description of an object, a process, or an event, or to the full understanding of such a description. It has always been commented upon that our boys and girls when they leave school lack the ability to clothe their thoughts and ideas in appropriate words, and it is therefore necessary that these subjects, as well as spelling, should be continued to be taught as long as possible. But with the ripper age there also comes to the young mind a greater facility to understand and appreciate the writings of our classical authors, and English literature has therefore been included in the curriculum.

Agricultural education also includes a careful mathematical training, especially in the form of arithmetic. Every opportunity is taken to connect figures with facts, and the pupils are trained to solve the simple problems of price and measurement that are of constant occurrence in daily life. Euclid, algebra, and mensuration form important branches of the mathematical subjects. They develop the reasoning faculties; and a sound mathematical knowledge is of the greatest advantage, not only to the farmer, but in many other professions and callings.

Current with this training of the reasoning and calculating faculties, observation is cultivated by experimental chemistry, first elementary, and then as applied to farm practice. In order that this subject may be taught thoroughly, the Government have saved no expense in supplying each agricultural class with a splendid assortment of chemicals and apparatus: and that this outlay has not been misplaced is shown by the interest which the scholars take in the chemistry lessons.

Drawing offers a ready means of training the hand and eye, and is therefore continued to be taught in the agricultural classes in the shape of geometrical drawing.

However, the classes would not deserve their name of being agricultural if agriculture were not taught, and a certain number of lessons are set apart every week for the study of agriculture, fruit, and viticulture, and to impart sound practical information, which is calculated to be of advantage not only to the farmer but to everyone. It is not only the professional orchardist who has to know the cultivation, habits, training, and everything connected with fruit trees, but in our country, where nearly every house possesses its miniature orchard or vineyard, the information gathered at school will be useful to every boy and girl. But mere word-teaching is strictly avoided, and theory and practice are made to go hand in hand. For this purpose blocks of land have been procured in connection with the agricultural classes, and here the boys put to a practical test the information gained in the classroom. Different varieties of wheat and the application of various manures are tested, and the results of the experiments carefully noted. Fruit trees and vines are planted, and everything is learnt by actual observation.

Last, but not least, manual training is introduced in the shape of carpentry. The Government have supplied benches and a splendid assortment of carpenter's tools to each agricultural class, and in connection with the practice in the use of any tool the pupil learns its construction, the reason of its shape, and the history of its development from other simpler forms. The saw, the plane, the chisel are each made the subject of an object lesson to the pupil.

I cannot pass this subject without making reference to the objection which is sometimes raised to the introduction of manual training into our State schools, on the ground that as the children generally leave at an early age, and many of them spend their lives for the most part in manual labor, such time as they can give to study should be occupied in other pursuits, in cultivating a taste for reading and in the acquisition of book knowledge. This objection is due to a misconception of the true objects and aims of education, and to an imperfect knowledge of what is meant by manual training. To assume that the best education can be given through the medium of books only, and cannot be equally well obtained from the study of things, is a survival of old notions against which nearly all modern educational authorities protest. But there is another and more deeply-rooted error in this argument. People often talk and write as if school time should be utilised for teaching those things which a child is not likely to care to learn in after-life; whereas the real aim of school education should be to create a desire to continue in after-life the pursuit of the knowledge and the skill acquired in school. In other words, the school should be made as far as possible a preparation for the whole work of life, and should naturally lead up to it.

The General Secretary complimented the essayist upon the masterly way in which he had treated his subject.

Mr. E. R. Peake considered any such schools as that at Naracoorte were a boon to the community, and it was a pity the attendance was not much greater. Such teaching fitted young people for the battle of life much better than if they had been without it. With the technical knowledge thus acquired the recipient would be better able to use his or her mental powers in connection with any work that had to be undertaken.

Mr. W. E. Fisher said it was a question as to whether it was educational talent or common sense that made the good worker. While believing in education of this description, he did not think it was altogether necessary to develop a good worker.

Mr. J. Davidson said we had ample results of technical education in the world, and it has proved that an educated man could do more manual work in a given time than the uneducated.

Mr. R. Campbell thought hard work should be done by the younger people and not by the aged, as was the case in many instances. They wanted instruction even to break stones.

Mr. G. Quinn referred to a suggestion made by Mr. Krichauff some time since *re* the establishment of schools of such description, who pertinently raised the question of the procuration of competent teachers. He did not believe in young men going straight out of the agricultural classes and trying to teach other young people. They must have knowledge themselves before they tried to teach others. He believed in teaching the children the powers of observation, and gave an illustration of the ignorance of some horticultural men in grafting. He agreed with the others in eulogising the school work.

Mr. Fisher believed in technical education, but he did not see that the educated man could work any better with such an acquisition, and supported his assertion with an example. His boys had been mentally trained at Mount Lofty some years ago at considerable expense, and he could prove there was very little better work done in that part of the State now than formerly. He referred to manual labor.

Mr. Davidson referred to the education as a great lifter up in the world. Through education they could now make as good cheese in South Australia as in New Zealand, only the name of the latter gave it precedence in the markets.

The Middleman.

Mr. R. Campbell read the following paper :—

The producer generally has so long relied upon the middleman as a necessary factor in the marketing of his produce, that with the increase of such agents he is inclined to conclude that such increase gives him more and better facilities for the disposal of his goods. While it is correct that there are middlemen and middlemen, and, in many cases, some agent must stand between prime producer and distributor; still, it is a very different thing for two or more such agents to exist midway, one selling to the other. The writer, however, ventures to raise the question "Is the middleman necessary?" and reply, "Under present conditions—yes." This necessarily raises the question, are present conditions the best? I think not. Where produce or stock are sold by auction without combination at a known charge, fixed by healthy competition, there can be little doubt but that the seller generally gets full market rates, but when combinations are made by buyers or agents, or both, to the sellers' disadvantage, or for the auctioneer to make an additional charge to the purchaser, the prime producer must suffer every time. To be more explicit; it is known, and ought to be well known, that a certain class of city salesmen, in addition to their fixed rate, make another charge to the purchaser "for delivery." Knowing this, purchasers do certainly not give the full price for goods where such a charge is to be made. Again, another class of salesmen have agents throughout the country districts buying up stock, &c., for consignment, the funds for which purpose have been advanced by said salesmen. This is done to ensure stock passing through their hands. Again, other agents are paid a commission on stock forwarded from certain districts, and in some cases even though they have done nothing to influence the stock being sent to the particular agent. Now, I would like to ask, is it likely that an independent stockowner has the same chance where a large yarding of stock takes place which has been paid for by the salesman's own money, especially where such stock are not sold by auction? Most certainly the salesman's own stock would be sold in preference to the casual signor's. It may not be generally known that in the city some classes of stock are sold privately, others by auction. Not long since a number of salesmen advised their clients, "that, in future, lambs would be sold by auction," pointing out that "this would be in the sellers' interest." Now, if it is to the lambowner's interest that his stock should be sold by auction, it must certainly be to the interest of owners that all stock should be disposed of in a like manner. The following will illustrate the evils of present conditions. Two owners sent different classes of stock to the same salesman, one with a reserve, the other without. A difference on the question of price on the reserved lot took place between the salesman and the prospective purchaser. "Well," said the former, "I cannot knock anything off this lot (the reserve one), but if you will take both I will take 6d. per head less for the other (the unreserved one)." The case needs no comment. Where stock are sold in the city markets there is no doubt the auction system, untrammelled by tricks, is the best, as healthy competition will ensure the highest market price, and, with present facilities by rail, stockowners can forward direct themselves. If full trucks cannot be sent from one owner two or more could combine, and so

reduce transit charges to a minimum. As facilities for shipping frozen meat (especially lamb) are now in good going order, owners, individually or by combination, could forward their stock for treatment, dispatch, and sale, on their own account, and so secure all there is to be made out of them for themselves. By patronising the export trade the city markets will be kept more bare of stock and so prices will be higher. Wheatgrowers could bulk equal samples and sell in shipping parcels and so secure an extra price above what is offered for "farmers' lots," or by combination could ship to London and so make all that was to be made out of it. This has been tried and found profitable. If farmers, stockowners, and other prime producers had their own local agencies for the dispatch or disposal of all bulk marketable products they could about dictate their own terms of sale or bring about a healthy competition between city salesmen for the sale of stock, &c., and so save enough in commissions to pay local expenses, and could be sure they were getting best market rates. Eventually they might even have their own auctioneer or salerooms for the disposal of all manner of farm products. Individualistic effort could not always work the business to the best advantage, but energetic co-operative combination could.

Mr. Fisher was not adverse to the statements made. He related his experience in his dealings with city agents and auctioneers, and considered he had been imposed upon by excessive "advertising," "delivery," and other charges in connection with the disposal of produce. It was a gross injustice, and yet they could not prevent it as at present without co-operation.

Mr. Caldwell agreed with the theory of the paper, and believed the present state of affairs resolved itself into one thing—every man for himself.

Mr. E. R. Peake said he did not know anything about charges complained of as made by auctioneers.

Mr. Molineux stated that the paper was rather severe on the agents or middlemen, and, as he was going to publish the paper *verbatim*, no doubt exception would be taken to some of the author's remarks. He had an idea the charges stated were a little exaggerated.

Mr. Campbell said it pleased him much to be roused upon a subject which he knew to be a fact. He furthered his paper by quoting examples of the glaring injustice done to the producers by these middlemen. It was the producers' fault, and he hoped Mr. Hassler's class would be so taught as to cause a reform in this direction, and not be so foolish as their fathers were to allow this state of things to exist in the future. He considered the profits of the agents were far too excessive, and again urged the theory of co-operation. He had no doubt that if the farmers went properly to work they could oust the middleman out of existence. They could be placed on the land and work like other farmers.

Mr. J. Davidson said from experience it seemed to him that the middleman got the cream of the farm produce and the farmer himself only received skim milk. He supported most of the writer's remarks, and referred to a ring comprised of mowing machine manufacturers of America and agents abroad. A single machine could not be obtained from these makers, unless through the agents. In his opinion that was not at all right.

Mr. Fisher considered that to overcome this difficulty it would be necessary to have a co-operative factory for the manufacture of machinery.

Mr. Molineux did not favor co-operation in such matters as had been referred to. Our community was not nearly numerous enough, and trade would be insufficient to support the maintenance of extensive stores and factories. They could not do without the middlemen; they were a necessity in such a community. Auctioneers were also necessary to sell the produce, but any excessive charges should be abolished.

Mr. Campbell disagreed in regard to their being a necessity, and supported his paper in still stronger tones.

Mr. J. D. Wilson (Penola) supported Mr. Molineux's last statement, and considered the high expense on the goods sent by rail was due to the Government charges.

Progressive Dairying.

Mr. J. Davidson read a paper on this subject, the main portion of which consisted of a repetition of a similar paper read at the Strathalbyn Conference, and which was printed in the *Journal of Agriculture* in April last.

Discussion was adjourned until the evening session.

EVENING SESSION.

The discussion on progressive dairying was taken up by Mr. Caldwell, who seemed to have misunderstood some of Mr Davidson's remarks. It was afterwards explained that whilst abundant nutritious food would increase the quantity of milk given by any cow, it would not permanently increase the percentage of cream in that milk; but a good cow will give milk with a percentage of anything between 4.0 and 6.0, whilst an inferior cow may give a much lower percentage; therefore it will be far more profitable to keep the best cows and to feed them liberally with nutritious food. With deficient and inferior food both the good cow and the inferior animal will give less quantity of milk, but the *percentage* of butterfat will not be decreased.

Dr. Ockley said the Jersey and Alderney cattle gave much the richer milk, whilst the Holsteins gave a greater quantity of milk poor in butterfats.

The General Secretary explained that the Jersey, Guernsey, and Alderney cattle originated most probably in the Normandy breed, and by long breeding on the separate islands, where penalties had prevented introduction of any other cattle, each family had developed persistent characteristics. Until recently ships cleared from the port at Alderney, and cattle from the three islands were consequently called "Alderneys." The Americans favored the handsome animals from the island of Jersey, and it became the practice to name all cattle from the islands as "Jerseys."

Mr. Davidson said it was not creditable to the district that the Penola factory should be closed for six or seven months each year.

The Codlin Moth.

Mr. Geo. Quinn, Horticultural Instructor, gave a short history of the codlin moth, which was brought into South Australia about sixteen years ago, and through neglect of proper restrictive measures had spread over the greater part of this State. There were some fruit growers in the affected districts who actively pursued remedial and preventive measures so successfully that they suffered practically little loss, whilst their neighbors who neglected or perfunctorily attended to their trees lost the greater portion of their apples and pears. He then gave a detailed life history of the codlin moth, from the caterpillar which lived hidden in a cocoon since last season becoming a chrysalis, then emerging in the form of a perfect codlin moth, which deposits generally one egg on the fruit or a leaf close to the fruit; the egg producing a minute caterpillar which eats its way into the centre of the fruit, generally finishing by eating the seeds; then, when fully grown, usually emerging through a hole in the side of the fruit and quickly going through the same transformations as its predecessor or parent. In this way there could be three generations during the season, and as each moth lays a considerable number of eggs, the increase from a single caterpillar at the beginning of the season may amount to many thousands before the end of autumn. Mr. Quinn repeated the advice which has so often been given to avoid "return" fruit cases, or to have them scalded *before* they are allowed to come back into the district; to have fruit stores made

moth-proof, so that no moths can escape at the beginning of the season; to spray with arsenical compounds when the fruit is no larger than a pea; to carefully attend to bandages on all trees; to remove all possible harbors from orchard and from the trees; and he exhibited several specimens of fruits affected by the caterpillars, also living and dead caterpillars and mature codlin moths.

Mr. E. A. Storey argued that any resolution asking the Government to enforce the regulations in respect to codlin moth would be futile, as the Government had neither the money nor the inclination to do it. If the regulations were to be firmly enforced on every possible occasion they would be an instrument of tyranny whilst giving a loophole for the spread of the pest. The experts had not practically demonstrated that the pest can be eradicated in any one district, and therefore cannot shut the mouths of those who say it is incurable. The Government might set an example by stopping the indiscriminate carriage of returned empties on the railways. Until this is done it is not just to prosecute private carriers. As the Act has failed—either through inability to enforce it or because its scope is not large enough—the fruit-growers should be empowered to help themselves by means of local fruit boards, upon the same lines as the vinegrowers are by the Phylloxera Bill.

The following resolutions were unanimously adopted:—

“That the Department of Agriculture is requested to vigorously enforce the provisions of the Codlin Moth Act.”

“That the Government be asked to enlarge the scope of the Codlin Moth Act by giving power for the optional formation of local boards, such boards to have power to make regulations subject to the Act, for the more effectual prevention of the spread of the codlin moth.”

Next Conference.

It was resolved that Millicent Branch shall be requested to arrange for the next Annual Conference.

Conclusion.

Proceedings terminated shortly after 10 o'clock p.m. with votes of thanks to everybody, not forgetting those who had provided the free luncheon and tea.

CENTRAL AGRICULTURAL BUREAU.

MONDAY, MAY 20.

Present—Mr. F. E. H. W. Krichauff (Chairman), Sir Samuel Davenport, K.C.M.G., Hon. A. W. Sandford, M.L.C., Messrs. W. C. Grasby, M. Holtze, Thos. Hardy, H. Kelly, T. Price, M.P., A. Molineux (Secretary).

Railway Freights on Fertilisers.

The MINISTER OF AGRICULTURE forwarded communication from the Railway Commissioner, in reply to request for reduced rates on carriage of fertilisers. The Commissioner, while admitting that the Victorian rates had been slightly reduced, stated that he could not recommend any reduction in our charges. He would be quite prepared to follow the Victorian example if our railways were, like those of Victoria, so situated as to secure the whole tonnage for some considerable distance of line; but the numerous ports which our railways touch enable the farmers to distribute the manures over the country by short rail haulage. The Commissioner noted that what the Agricultural Bureau asked was that the manures should be carried at lowest rates in force, and this was done, as pointed out previously.

Codlin Moth Regulations.

Clare Branch directed attention to the following resolution passed at their latest meeting:—"That proper inspection and care had not been exercised in this district recently in regard to the supervision of the Codlin Moth Act, in that a number of empty fruit cases infested with codlin moth had been brought into the district without the necessary precautions being taken. This Branch desires that the provisions of the Act be strictly enforced and infringements thereof be legally dealt with."

The SECRETARY reported that the Belair Branch had carried a resolution protesting against the proposed relaxation of the regulation, as the members were of opinion that it would be detrimental to the apple industry to allow the indiscriminate sale of affected fruit. Similar resolutions had also been carried at the recent Conference of South-Eastern Branches, held at Penola.

In reply to question, the SECRETARY stated that the special meeting to consider Mr. Robson's resolution would be called for June 12.

The Visit of the Duke of Cornwall and York.

The CHAIRMAN thought it was worthy of consideration whether the Agricultural Bureau, as representing the agricultural interests of the colony, should not present an address of welcome to His Royal Highness the Duke of Cornwall and York on the occasion of his visit to this State. The prosperity of the State was largely dependent upon the operations of the tillers of the soil, and he thought they should be represented on such an auspicious occasion.

It was resolved, on the motion of Mr. HARDY, that the Bureau should present an address of welcome to the Duke of Cornwall and York, and that a committee—consisting of the Chairman, Secretary, Sir Samuel Davenport, and the mover—draw up the proposed address.

Paspalum dilatatum.

The MINISTER OF AGRICULTURE called attention to letter from the Mayor of Adelaide in reference to this grass, in which it was suggested that the department should purchase 100,000 plants for distribution throughout the State; also that a report on the grass should be obtained from the adjoining States.

The SECRETARY said there was no necessity to ask for reports as to the value of the grass, as it had been proved to be very valuable in suitable soils and localities. To distribute it throughout the State as suggested would be waste of money, as the grass must have a fair amount of moisture in the soil during the summer or it will not thrive. Apart from this the grass was advertised by many seedsmen in the adjacent States at reasonable prices, and it was against the principles of the Bureau to distribute plants of proved character and readily obtainable from the seedsmen.

Members agreed, and it was decided that it was unnecessary to interfere in private enterprise in this matter.

New Wheat.

The CHAIRMAN tabled sample of Theiss wheat received from Professor Czerharti, of Hungary. It was reputed to be drought-resisting and very strong in gluten. It was decided to distribute it amongst certain members of Branches for trial.

Mr. HOLTZE was afraid it would prove one of the so-called creeping wheats, and would not be suitable for our climate.

Extracts and Translations.

The CHAIRMAN tabled the following:—

Slugs and Snails.—It is recommended to distribute, after sundown, about 20lbs of sulphate of iron, in form of powder, per acre. Any insects that touch it are killed and plants are not damaged.

Angora Goats.—South Africa levies a duty of £100 each on all exported Angora goats. From 18,000,000lbs. to 20,000,000lbs. of mohair wool is now produced, chiefly in Asia Minor, out of which Australia is credited with about 600,000lbs. In the United States the wool deteriorates in humid and low localities. Australia and South Africa are very suitable.

Phylloxera.—The Governor-General of Algiers has published, on the 3rd of January, 1901, an order to regulate the circulation of plants and agricultural and viticultural produce in the colony. Algiers is divided in four zones—the indemnified territories, the protected, the contaminated, and those under free cultivation. The conditions under which cuttings, rooted vines, &c., can be forwarded, are that they must be in soldered cases, and rooted vines have to be disinfected before being forwarded.

A Town Forest.—I have repeatedly stated that certain villages in Germany required to pay no district taxes; on the contrary, that the owners received in most years such sum as could be distributed by the rural authorities as a surplus from the common orchard or fruit trees planted along the roads, after providing for the needful repairs or improvements. Now I find that Freudenstadt has been, ever since about 1875, in the enviable position to pay yearly to each of its about 1,300 burghers a sum varying about 25s. to 55s. from the profits arising from the forest owned by the little town. Another instance is Sauldorf, in Berlin, where the eighty-four ratepayers each receive, every year, wood and turf for burning of the value of £5. Lately £830 was divided amongst them, or about £10 to each, as surplus from sales of timber, and the village has yet a capital of £3,000, and, of course, no debts. The forest owned by the village can provide all this.

Feeding of Pigs.—Professor A. W. Henry, of the Wisconsin Experimental Station, United States, reports that after most numerous and extensive experiments on American stations, it is unanimously settled that it is preferable not to boil any grain for fattening pigs, as a heat of 75° Celsius makes the albumen less digestible. Of course, potatoes and many other food materials should be boiled, or the pigs would not eat a sufficient quantity.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Balaklava, Mr. G. Neville; Johnsburg, Mr. W. Buchanan; Port Germein, Mr. W. Holman; Gawler River, Mr. E. Winckel; Port Elliot, Messrs. T. Goode and F. Basham; Stockport, Mr. H. Branson; Pine Forest, Mr. F. Bayne; Koolunga, Mr. Thos. Freeman and Geo. Jose; Albert, Messrs. J. Anthony, J. Stengert, and H. Albert; Forster, Mr. F. Randell; Kadina, Mr. J. Malcolm; Lucindale, Mr. P. J. Robson; Hawker, Mr. S. Bowden; Paskeville, Messrs. P. A. Blackman and W. Curnow; Colton, Mr. J. McCracken; Woolundunga, Mr. F. Emery Chapman; Mount Pleasant, Messrs. Edward Miller and W. B. Randell; Wilson, Mr. J. Nelson; Rhine Villa, Messrs. W. Farey, F. F. Payne, and Allan Payne; Narridy, Mr. B. Flavel; Gladstone, Messrs. W. Brayley and J. R. Smallacombe; Pine Forest, Mr. R. W. Bawden.

Reports by Branches.

The SECRETARY reported receipt, since previous meeting, of ninety-four reports of Branch meetings.

PREPARING BARRELS FOR LIQUIDS.—If live steam cannot be used—and this is best—half fill the barrel, and drop in half a peck of unslacked lime. Heat will be evolved, and the lime will unite with the tannic and other acids in the wood. Let the lime water remain about ten days, stirring or rolling now and again, and then replace it with salt water, after rinsing the barrel. Leave the salt water to soak out the lime, &c., for a week, and finally empty the cask, and refill with clean pure water, which should be left twenty-four hours. The barrel can then be emptied, dried, and used for any liquid. Old barrels may be cleaned with strong hot solutions of potash applied two or three times, and then rinsed with pure water.

REPORTS BY BRANCHES.**Rhine Villa, April 27.**

Present—Messrs. J. A. Payne (chair), A. Lewis, F. F. Payne, H. Mickan, G. A. W. Schick, W. Farey, H. W. Payne, J. W. Vigar (Hon. Sec.), and three visitors.

DAIRYING.—Mr. F. F. Payne read a short paper on this subject. He thought the district too dry for dairying operations on a large scale to be profitable, as feed would have to be conserved for the cows' use during the autumn and early winter months. It will pay the farmers, however, to keep sufficient cows to supply the requirements of the household. He considered the Ayrshire crossed with the Shorthorn would provide the best class of cow for them to keep. A cool and well-ventilated cellar was a necessity. Mr. Payne advocated the use of the separator, and urged the necessity for extreme cleanliness.

Norton's Summit, April 27.

Present—Messrs. J. Jennings (chair), A. Smith, J. Hank, J. Pellew, J. J. Bishop, and W. H. Osborne (Hon. Sec.).

DAIRYING.—Matters in connection with the Jersey bull loaned to the Branch by the Department were dealt with.

FRUIT EXPORT.—Reports and private information from Western Australia suggesting the removal of the barriers at present existing against the importation of fruit from the eastern colonies were read, and considerable discussion ensued.

Mannum, May 3.

Present—Messrs. J. G. Preiss (chair), R. Heidrich, J. A. Schultze, J. H. Wilhelm, J. W. Haby, E. Schuetze, J. Nickels, J. W. Walker, R. P. Scott, B. Baseby, and Hy. Brown (Hon. Sec.).

BARLEY-GROWING.—The Hon. Secretary called attention to letter that appeared recently in the daily press in reference to prices obtainable for good clean barley fit for malting purposes.

GRASSES FOR DISTRICT.—This question was discussed, and each member agreed to watch carefully any experiments that came under their notice, and to report at future meetings.

HORSE-BREEDING.—Mr. J. A. Schultze read a paper on this subject. The breed of horses throughout the State, and particularly along the Murray Flats, had deteriorated considerably. It was an important matter to the farmers and to the State generally. Many farmers seem to be unaware of the fact that it costs but little more to rear a good horse than a bad one, whereas the good horse will do more work and will fetch a much better price than a mongrel. One difficulty breeders have is that when the season comes round they do not know what stallions will travel the district, and inferior horses that are started early are given most of the mares. To remedy this he advocated holding a parade of breeding stock annually in farming or breeding centres at a convenient time, when owners of stallions and owners of breeding mares could come to definite arrangements. Considerable discussion ensued, and a resolution was carried asking the local Agricultural Society to call a meeting to discuss the best means of improving horse stock.

Davenport, April 25.

Present—Messrs. W. J. Trembath (chair), J. Holdsworth, J. E. Lecky, T. McDonald, W. Penna and J. Roberts (Hon. Sec.)

WOOL-CLASSING.—It was decided to ask some of the neighboring sheep owners for samples of wool for show purposes and for wool-classing, and also to ask Mr Geo. Jeffrey to give a lecture on wool-classing

POULTRY.—A committee was appointed to inquire into possibility of forming a local poultry breeders' association.

Redhill, April 30.

Present—Messrs. R. T. Nicholls (chair), A. A. Robertson, R. H. Siviour, F. Wheaton, A. McDonald, H. Darwin, A. E. Ladyman, D. Steele, D. Lithgow, W. Steele, and J. N. Lithgow (Hon. Sec.)

WHEAT FOR SEED.—Mr. Wheaton read a paper on this subject to the following effect :—

Wheat intended for seed should be selected before the crop is ripe, and only the cleanest portion of the paddock saved. There were quite enough weed seeds in the soil without putting more in with the seed. The question of large *versus* small grain has received considerable attention. He did not think it always necessary or even desirable to select the largest and plumpest grain for seed. It often happens that one paddock will produce larger seed than another, although sown with same sample of seed. Red rust, dry weather, or even the position of the paddock may affect the size of the seed, and in his opinion moderately small seed was as good as the largest, in fact, perhaps better, as there were more grains to the bushel, and it was also less liable to being cracked by the stripper. The best grain from a crop injured by red rust or other cause would be good seed, as it would be the hardiest grain, and likely to produce good wheat when sown. Seed wheat should be cleaned as soon as possible after being reaped, and should be put through the machine twice, so that there is no straw or chaff in it. Unless this is done it will not run evenly through the drill or broadcast sower. Should there be any small weed seeds in it put it through circular screens. It was not possible to say what variety of wheat was best suited to any one locality. Different soils require different kinds. For their slopes he favored Dart's Imperial. Purple Straw in favorable seasons yields well. Hamlyn's and Eclipse, though of smaller grain, had done well with him. King's Early yielded well, but went down badly, and was troublesome to ream and clean. For the flats he favored Baroota Wonder. Leak's Rustproof was good for wheat or hay. Last year he tried Majestic from Central Bureau seed, but this was badly pinched, owing probably to being caught by the hot winds at its most susceptible period of growth. Early maturing wheats should not be sown before the end of April or beginning of May.

Members agreed that the seed wheat should be as clean as possible. They did not think pinched grain could be sown year after year without considerable deterioration taking place. Members were of opinion that a large proportion of the seed sown each year was wasted owing to having been injured by the stripper, but notwithstanding this loss the stripper was the cheapest machine for gathering it. Some members thought that the wheat intended for seed would be all the better if left standing for a time after it had ripened, even if it got a little bleached. The varieties mentioned by Mr. Wheaton were considered good, but Purple Straw would, but for the risk of rust, be a hard one to beat.

Pine Forest, April 9.

Present—Messrs. W. H. Jettner (chair), A. Mudge, F. Masters, R. W. Bawden, and R. Barr, jun. (Hon. Sec.).

IMPROVEMENT OF HORSE STOCK.—The question of procuring a good draught for the district was again discussed, and it was decided to ask the co-operation of the branches at Bute, Mundoorra, and Port Broughton in the business.

FIELD TRIALS.—In view of the many single trials of cultivators, seed drills,

and similar implements lately held in the locality it was thought a pity that concerted action could not be taken, so that a fair comparison could be made by farmers between the different implements. After discussion it was resolved "That it be a recommendation to the Northern Yorke's Peninsula Bureau Field Trial Society to arrange for a field trial of cultivating and seeding implements in July next, under different conditions as to judging, and without inviting the co-operation of the importers."

MANURES AND MANURING.—The Hon. Secretary read the following paper on this subject:—

This is a subject of much importance to the district. We, as farmers, recognise the value of scientific research, as without the knowledge gained by years of study and innumerable experiments by men devoted to that particular line of labor, our labors would be less successful, and consequently our wages or reward would either be reduced or the world would have a dearer loaf.

It is common knowledge that the essential ingredients required for plant life are phosphoric acid, nitrogen, and potash; and the fact of using phosphatic manures with such highly satisfactory results is abundant proof of the lack of the first-mentioned ingredient in an available form in the soils of this State, while it also proves the presence of the other two in sufficient quantities, because the component part present in smallest ratio decides the yield. It may be necessary years hence to apply nitrogen and potash to farming lands in this district, as the use of superphosphates is bound to consume the supplies of the other elements at a greater rate; but from experiments with muriate of potash, gypsum, and sulphate of ammonia made by myself, the application of which made no appreciable difference in the yield, I feel certain that it is a matter for posterity to deal with. When we bear in mind how that 5 or 6 tons of farm-yard manure contains only an equal quantity of phosphates to that supplied by our usual dressing of super, we gain an idea of the value of scientific truth, as we know how impossible it would be to "make" and apply so large a bulk of stuff to our big areas. With respect to the different brands of commercial fertilisers, provided it is of a dry nature to ensure free running through the drill and contains 36 per cent of water soluble phosphates, it matters not where or how made, nor what brand it bears. Great care should, however, be taken by the farmer to keep it dry, and it pays to put through a sieve if inclined to be lumpy, thus admitting of an even distribution. The finer the particles the greater the efficacy.

Cost of Manures.—We believe the cost to farmers is as low as it is possible for importers to supply, and the freight charges over our railways are of the lowest. Importers and railway authorities recognise the general use of manures to be an important factor in increasing their business, as in addition to the seed and manure drills, altogether the effect of the innovation, it is not exaggeration to estimate three of each of the following articles required by the farmers instead of one:—Binders, cultivators, and harvesters, not to mention organs, pianos, &c. While it has been estimated that 3 tons of wheat is carried over the railways for and as a result of every ton of manure. We will do these persons here mentioned the justice to believe then, that while it is politic to keep their charges low they will continue to do so.

There are two progressive matters for congratulation to this district in connection with this subject, viz., the decision of the Wallaroo Smelting Company to engage in the manufacture of superphosphates, and the commendable action of the Minister of Agriculture in offering a reward of £500 for the discovery of a deposit of marketable mineral manure.

The practice of manuring having become so general is largely due to our agricultural expert, Professor Lowrie. I do not say he is blindly followed by the average South Australian farmer, but he possesses the confidence of the majority of farmers to such an extent that any recommendation from him is respected, and followed, if possible. Of course, teaching us what he *knows* is the correct thing in agricultural matters, is part of his business, but to know so many things by experience and wide observation is a credit to him and benefit to us. However, we have, notwithstanding the advantages of his teachings, to act an independent part according to our environments. At a school examination in England, while a lesson in geography was in progress, the inspector asked a lad how he would go about finding Madeira Island? and he replied, "I would go first of all to Southampton." "Well, and what then?" "I would find a steamer going there and leave the rest to the captain, who knows far more about it than I do." Well, to leave everything to Professor Lowrie, or to accept his rules at Roseworthy for all parts of the State, would never do; and when he advises an application of 2cwts. super. to the acre, it is understood on all hands that similar land and an equal rainfall are necessary allies for building up a big wheat yield. On our light sandy soils it has been clearly proved during the past season that 1cwt. is an excessive dressing, and most farmers agree that 56lbs. per acre is sufficient. Yields of 16bush. and 17bush. per acre have been obtained with that quantity on fallowed land, and in proof of the fact that even that quantity is not all used up by the first crop, it is only necessary to cite cases where yields of 10bush. or 12bush. have been secured this year by broadcasting seed only on land manured the year before.

Manuring with superphosphates by means of the seed and manure drill is now universally practised in this district, so firm is the belief in the profitable nature of the change; and so convinced are all farmers on the superiority of the system, that it would be difficult to find one to go to the expense and trouble of working the land unless they could procure the necessary manure to give it a dressing. Manuring, however, cannot take the place of cultivation, neither can cultivation take the place of manuring. The most profitable practice, in my opinion, is to fallow; then take two crops off in succession, scarifying or cultivating instead of ploughing for the second crop, but drilling in with manure both times.

Some people seem to have the idea that the constant use of super. will sterilise the land, in spite of the denials constantly made by the General Secretary of the Agricultural Bureau, Professor Lowrie, and other scientists. It seems stupid ignorance to declare a man guilty of starving his stock by providing extra food, yet the above statement amounts to the same thing. Barbed wire may be used to keep the stock from helping themselves if no man gave it to them, but if the food provided is also applied rightly, a marked difference for the better will soon appear if the stock were stinted before. And should it become necessary to supply another ingredient to the land in years to come, it would only be a substitution of one manure for another, and be equivalent to changing crushed oats for bran and pollard to mix with the chaff for stock. No deleterious effects are noticeable yet where land has been phosphated for four or five years, on the contrary, the grass is more abundant and of a better quality, as proved by the greater number of sheep which can be kept in better condition on the same land as compared with days gone by before manuring.

Judging from the results already obtained, and the evident feeling in favor of fallow, the area of which ought to be at least twice as great as at present in this district, I think a two-figure wheat average for South Australia is quite within the bounds of possibility.

Morgan, May 3.

Present—Messrs. R. Windebank (chair), H. H. Plummer, W. G. F. Plummer, R. Wohling, E. Jacobs, C. Moll, T. T. Schell, C. F. W. Pfitzner, J. Arndt, G. Ruediger, and E. French (Hon. Sec.).

FROST-BITTEN WHEAT.—Mr. W. G. F. Plummer urged members to closely observe and try to discover which varieties of wheat are most resistant of frost. Members replied that it is not known to them at what stage the trouble arises, whether whilst the ear is covered by the sheath or afterwards. Scientific men might be able to discover this, but it would probably take the lifetime of an ordinary farmer to fathom the mystery.

BULL.—The whole of the members will act as a committee to see that the bull loaned by the Agricultural Department is properly looked after.

“HOW TO MAKE BRANCH WORK MORE INTERESTING.”—Mr. H. H. Plummer read a paper to the following effect:—

To effect this object the Bureau places before agronomists the experience of the whole of its Branches, and the intelligence, study, and observation of the different members are within the reach of every individual. Then there are men of scientific experience who are constantly attending different places of meetings, giving lectures and practical illustrations on various subjects. There are many who discount the knowledge of these learned men, but if those persons were as proficient in their calling as are those who are devoting the best part of their life for the success of the agronomists generally, greater progress would be made. There are many ways by which our Branch work can be made instructive and interesting, such as by giving up methods that have been tried for years without any good results, and by following the more practical methods that are in use by men who have the faculty of knowing right from wrong. The Bureau as a whole has worked wonders for the agriculturist in this State, and the medium by which it vices its instructiveness is the best journal of its sort in any of the States for edification of the producer. Our climatic conditions in this locality are not all that could be desired, and we are cut off from experimenting to a certain extent with any good results. Our old practical farmers, who have had the pleasure of watching their systems expand and have achieved success, scatter broadcast the knowledge they have gained for the benefit of their fellow producers; so within our dry districts, where we have a good river adjacent, we may be able to accomplish many things in time that seem at present to be impracticable. In districts where the rainfall is not reliable artificial means must be employed in order to make our labor profitable. There are many acres of ground around Morgan that could be successfully irrigated, and it is well known that in Spain, where crops are grown on

land under irrigation, where the tenant has to pay a higher price per acre for his holding, the profits are considerably better than from land held at a cheap rental without water. It is almost the height of folly for one to think of farming and putting in large areas of wheat in a dry country. A more sure method is to put in less, and to give every attention to the best means of retaining moisture in the soil. It is a well known fact that when the surface of the soil is kept loose it prevents evaporation from the subsoil. Take for an illustration the sandy country, where the surface of the soil does not cake; they who hold that description of country never have a total failure, and the secret lies in the fact of the soil being always loose. Farmers who reside in the dry districts, who are assured, perhaps, of only one crop in three or more years, should if possible gather the whole of their crops with the twinebinders, and then they would have plenty of fodder to sustain their stock during the dry period, and would also be able to keep more stock than at the present time. Many of them are poor to-day through no other cause than starvation of their stock. The minor products of a farm could be realised with greater amount of certainty if the farms were worked with more system. If dairying were adopted the prudent farmer should keep only the best of cows, as they would have to be fed on costly fodder, and it does not pay to keep poor ones, and this applies to all other stock. The use of the seed drill with phosphatic fertilisers has not been adopted in this locality to any extent, because most of our farmers think that phosphoric acid is not deficient in their soils; but this is a matter that must be determined by experiment. The Bureau has helped to unveil a good many seeming difficulties, and has made farm life more interesting and profitable to those who have followed its course. Exercise of the intellect and reasoning faculties, allied to study, observation, and practice, with a liberal exchange of ideas, opinions, and experiences, and frequent meetings will surely result in material advancement of all agronomical industry.

Port Pirie, April 27.

Present—Messrs. P. J. Spain (chair), H. B. Welch, W. K. Mallyon, J. Lawrie, G. M. Wright, G. Hannan, W. Smith, T. Jose, T. Johns, T. A. Wilson (Hon. Sec.), and two visitors.

BACON-CURING.—Mr. T. Johns read the following paper:—

The first thing necessary is to get good raw material, for you cannot make good bacon out of a ball of grease; then feed it with good, solid food for a month before killing. I do not think it matters much what it lives on during the other part of its existence, but you cannot get a better class of pig than by mating a good Berkshire boar with a roomy, long, deep sow of any breed. People sometimes praise up a pig because it has a wide, square back. Well, that is not the pig for bacon, as the back is all fat. A pig that weighs about 160lbs. dressed is a nice size for bacon, but for hams you want a pig weighing when dressed about 200lbs.

PROCURE.—The pig is stuck, and when scalded in the usual way—not with boiling water, but with a little cold added according to quantity used. Scrape off all the hair you can with blunt implements, then go over it with a knife sharp enough to shave off any hairs that may be left. Hang the carcass up and wash with cold water, cutting the head off as soon as possible to facilitate the blood running out. Open and take the inside out and let hang till next morning, then cut the carcass up into pieces for curing, sprinkle it with salt and put it in a suitable place to drain, leaving it till night. In curing I use five ingredients—salt, 2lbs. to 1lb. of brown sugar, saltpetre, pepper, and carbonate of soda, mixing them together by guess as to quantity of each according to the quantity of meat to be cured. I give the meat a good dressing with the mixed ingredients, then let it lie flesh side up for two days; then turn it, adding more of the mixture; turn occasionally, letting it lie in salt—ten days or a fortnight if for bacon, for hams a week longer—keeping it in a wet, sodden state. When cured I wash it thoroughly, first in cold water then in lukewarm; keep it damp for a few hours, then sprinkle the flesh side with white crystal sugar and roll it; hang it up till it gets a bit dry—not too dry, say two or three days; then smoke it, using mallee sawdust.

Mr. Lawrie advised growing mangolds for pigs, and would also use peas as food for fattening. Mr. Jose feeds grain, oatsen hay cut very green, and ensilage to his pigs. Mr. Smith said a temperature of 156deg. F. is best for scalding pigs, but old pigs require hotter water than young ones.

FARMING AND GRAZING.—Mr. H. B. Welch read a paper as follows:—

Anyone owning sufficient land should combine wheat and hay growing with stock-keeping. Fattening sheep and rearing lambs being the most profitable in Pirie district, especially in the western portion, where saltbush and other nutritious herbage flourish in a fair rainfall. The eastern portion, being more sandy, the grass there does not possess the same fattening properties, but it is more suitable for wheat; so it is best to have land of both qualities, as sheep are

useful on sandy soil during rearing or fallowing time and for eating off too early crops. Early lambs have been the aim of most graziers until lately, but the freezing of them regulates the price now, so the advantage is not so great—the aim now is quality. Sometimes April lambs get stunted owing to lack of green feed; but it is preferable to have ewes lamb before the weather gets too cold, unless there is plenty of shelter. Last year I had May lambs—when green feed was more plentiful—weighing 40 lbs. at four months of age, progeny of Merino ewes and Shropshire and Lincoln rams, the Shropshire cross being the best. It does not often pay to rear sheep when near a market, unless in a good wool district with high class sheep. Our district is not good for wool, lack of shade and travelling for water causing a deterioration, especially in crossbreds.

Much damage is done to paddocks by sheep cutting up the surface soil around the water-troughs, allowing the wind to sweep soil and seeds away for a considerable distance. A remedy would be to have more troughs and smaller lots of sheep. Fattening wethers is profitable at times when sheep of suitable age can be obtained, which is not easy. Fattening cattle is risky, especially now they are so scarce, and risk of disease is much greater than in sheep. Dairy farming is profitable if the labor has not to be hired, but is disliked by some on account of the Sunday labor. With the use of fertilisers we can generally secure a good supply of hay. Horse-breeding is worthy of attention, prices now ruling being very encouraging, though draught stock may cheapen on account of the low price for wheat. To rear good horses they must be fed well, and it will pay to do it with hay at 30s. a ton.

By this combination a farmer spreads his labor over the whole year, as seeding, fallowing, shearing, hay harvest, wheat harvest, chaff cutting, fencing, &c., then seeding again—a change of occupation relieving the monotony of farm life.

Petersburg, April 27.

Present—Messrs. W. Miller, M.P. (chair), G. Naughton, H. Earle, S. Bottrill, E. Palmer, James Wilson (Hon. Sec.), and many visitors.

THE NINETY-MILE "DESERT."—The Chairman stated that he had been requested by the Hon. Minister of Crown Lands to accompany Mr. Scott, and with him to inspect and report upon the agricultural and pastoral value of a considerable portion of the so-called "Ninety-mile Desert," and he continued his remarks to the following effect:—

Leaving the railway at Tail-m Bend, we were driven in a Government trap along the grubbed road through to the Moorlands woolshed; the country here is very irregular. There are spots of good loamy soil, but mostly limestone ridges and sand, suitable only for pastoral purposes. Proceeding to Moorlands station, which is at present in charge of a Government caretaker, we found that this is poor grazing country, mostly covered with stunted mallee and other bushes. Passing through very poor grazing country, we came to Polly's Well, which is a splendid well, with engine, tank, and troughs, and capable of watering a large number of stock. We next proceeded along the cleared road over Pony's Range, which consists of limestone and sand ridges, very poor pastoral country. After crossing the range, and before reaching the hundred of Cotton, we entered the first good agricultural land that we met with. This consists of sandy loam and Bay of Biscay flats, with occasional sand ridges. The country is covered with stunted mallee, which could be easily rolled down. It appears to have been periodically burned down. We estimate that, passing through the unsurveyed country before getting to the hundred of Cotton, there is an area of 100 square miles suitable for agriculture. Some of this strip of country is equal to the best of the surveyed land at Pinnaroo. The hundred of Cotton has not yet been subdivided into blocks. On the western boundary of Cotton Parakee Well, sunk by the Government, affords a splendid supply of first-class water at a depth of over 200 ft. It is provided with whims, tanks, and troughs, all in good condition. So far as we were able to judge, the hundred of Cotton comprises good agricultural land. It covers 150 square miles, and we estimate that there is at least 100 square miles fit for agricultural purposes. Entering the hundred of Bews we came upon the Wow Wow Plains, consisting mainly of Bay of Biscay land, full of crab holes, covered with large mallee, pine, and bullock. A few blocks have been selected, and two are occupied. We inspected a small plot of wheat grown by Mr. Leckie. The crop was very good, but it was sown very late in the month of June. Mr. Leckie has reaped six acres and cleaned it up, with a result of sixteen bags. The remainder of the crop was still green. We also inspected a small crop of potatoes belonging to Mr. Leckie, and these were growing splendidly and promised a good return. Mr. Leckie, who has resided on various stations, in what is termed 'The Desert,' for twenty-two years, assured us that disease in stock or human beings was unknown in that country, which is very healthy. Accompanied by Mr. Leckie we left the Wow Wow Plains on Monday morning and

travelled through splendid agricultural land to the hundred of Parilla, which is very irregular, mostly sand ridges covered with low stunted mallee. *En route* we passed the Government well, known as the Scrubby Well, having a splendid supply of first-class water at a depth of 208ft. A quarter of a mile further east we passed a soakage spring with a small supply of water. The adjacent hundred of Pinnaroo comprises land the quality of which is equal to almost the best agricultural land in the colony. It consists of red loamy and dark Bay of Biscay soil. We found this hundred well timbered with pine, mallee, and bullock, and it looks as though there would be no difficulty in obtaining water by sinking. The Pinnaroo head station is within three miles of the Victorian border, about ninety-five miles east of Tailem Bend, in a direct line about fifty miles from Renmark, and about eighty miles from Bordertown. We travelled through the northern part of the hundred to the old Parilla station, passing through beautiful grassy plains, with grass over the horses' knees. Parts of the country are well timbered with heavy mallee and pine. There is a good well at Parilla. The old station buildings are tumbling down. We also inspected the country east of Pinnaroo station, extending to the Victorian border fence. This is good land, and from what we could see there is similar land across the border. On the return journey we followed the old bush track through Pinnaroo south of the cleared road, passing through good agricultural land. After inspecting the country and collecting all the information we could get from Mr. Leckie, Mr. Harvey, of Pinnaroo, and formerly of Kapunda, and other farmers, our impression is, that along the cleared track, through the surveyed hundreds, and including another hundred to be surveyed on the western side of the hundred of Cotton, there will be at least 500 square miles of good agricultural land; but it is impossible to grow wheat at a profit in the Pinnaroo country without the convenience of a railway, on account of the long distance and bad roads. We met Mr. Tiller, a selector in the hundred of Bews, who told us that he was perfectly satisfied with the country; but bad roads and long distances for the carriage of produce prevented his profitable occupation of the country, and he had to abandon it. Good water is procurable by easy sinking from surface springs to a depth of about 200ft. We passed through fair to good pastoral country from Polly's Well to Cooke's Plains. About ten miles is covered with speargrass 3ft. high. The Crown at present has no country in South Australia available for occupation equal in quality to the land in the Pinnaroo hundreds. Both Mr. Scott and himself would be prepared to leave their holdings in the North and take up land at Pinnaroo if they could dispose of their properties.

Mr. E. Palmer, in proposing a hearty vote of thanks to the lecturer for his instructive and interesting address, said he was very much impressed with the favorable account given of the country. If he was a young man he would be inclined to take a trip to the locality and take up a selection himself.

Mr. Bottrill seconded the motion, which was carried unanimously.

Forest Range, May 2.

Present—Messrs. J. Rowley (chair), A. S. Gunning, A. Green, H. Waters, J. Green, W. Cherryman, C. Stafford, J. C. Jennings, C. Norton, and W. McLaren (Hon. Sec.).

BLACK CURRANTS.—Mr. W. Chapman read a paper to the following effect:—

There are two or three sorts of black currants. In selecting for propagation be careful to choose from those plants that have produced the largest berries, and mark them by putting in a stake. The plants should stand in rows, 6ft. by 4ft. apart, so that they may shade each other when large enough to bear. See that the ground is properly prepared before planting, but do not dig too deeply afterwards near the roots, as they are liable to run near the surface. Keep the ground clear and loose in summer, to retain the moisture, else the soil will become dry, and the currants will shrivel before maturity. A rich black soil, with plenty of moisture, suits the black currant best; but it must not be too wet in winter. The position must be sheltered, and a high well-wooded hill to the north-west is the best shelter. Grow them vigorously, with plenty of foliage to protect the fruit against the sun. If the bushes are pruned back for a year or two they will form much denser growth, and after that they can be left to grow as they can; but suckers should be cut out. When moss begins to show on the stems cut them well back, with a view to start young growths. If a little is cut each year there will be a constant succession of new wood.

Mr. Monks thought black currants could not be grown successfully to any extent here, but the climate of Tasmania is more suitable, and they could be imported at rates against which growers here could not compete. If anyone wished to grow black currants it would be best to raise the plants in nursery beds.

Quorn, May 2.

Present—Messrs. R. Thompson (chair), G. Herde, J. B. Rowe, C. Patten, G. Altmann, H. Altmann, G. Walker, W. Toll, James Cook, and A. F. Noll (Hon. Sec.).

WHEAT-TESTING.—Members are much pleased to learn that it is proposed to erect the wheat-testing mill at Roseworthy College, as this will enable farmers to learn which are the best varieties of grain to grow for milling purposes.

KILLING PIGS.—Mr. F. Herde read a paper as follows:—

When killing a pig, it is best to stun it before sticking it. Take an axe or a hammer, and give it a knock on the forehead; it saves a lot of trouble. Have the pig lying on the right side, catch hold of the foreleg, pull the pig forward, point the knife straight for the tail, drive the knife forward, then turn the knife a little up and downwards, that will cut the blood vessels, and the pig will bleed all right; but have a knife with a straight point for sticking. As soon as the water is boiling and ready for use, put a little cold water in it. If there is no trough, lay some straw on the ground, lay the pig back upwards, the feet underneath, put a bran bag over it, keep the bag well on the pig, pour the water on the bag. That way you can do with less water, and it scalds better. Start at the head first, and move the bag as you go on. When all the rough work is done, lay the pig on a box, or hang it up at once, pour some cold water on it and wash it well off. Then have a good knife, and anything that is left will be removed easily. A good knife is half the work, and will make a clean job.

The Hon. Secretary tabled *Journal of Agriculture* for May, 1898, containing an article on "Pig-breeding and Bacon Curing," by the late Mr. Thos. N. Griereson, manager of Bodulla Farm, New South Wales, and the Chairman remarked upon the many valuable articles that had been published in the *Journal*, and advised members to closely study that publication.

Amyton, May 2.

Messrs. A. Gray (chair), Wm. Gum, Thos Gum, Wm. Mills, S. Thomas, R. Brown, John Gray, James Gray, A. Stone, Wm. Hughes, Wm. Hawke, John Kelly, H. B. Turner (Hon. Sec.), and three visitors.

THE MOST SUITABLE CLASS OF HORSES AND HOW TO BREED THEM.—Mr. James Gray read a paper to the following effect:—

Farmers do not always use enough judgment in breeding and selecting horses for farm work. If we want a good class of horse that will stand work and always look well, we must try to breed nice shapely draught horses of a fair size; they make steadier and stancher workers than the lighter class of horses, are fit to do road work when required, and will always command a good price when offered for sale.

To breed this class of horse we must select a good-shaped draught mare with good temper, a good worker, hardy, and will stand work, and, if possible, with heavy mane and forelock. The heavy forelock is a good protection to the eyes against flies, heat, and dust. A mare of this class mated with a well-bred draught stallion showing good points, of a fair size, a good walker, with quiet temper, should produce first-class farm horses—not the class too often found on northern farms and stations. We buy one of that class because we can get them for half the money we would pay for a good one, but at the end of the year it has cost us the extra money we would have given for the good horse, in feed, to keep the mongrel in working order.

The general complaint is that there are so few foals left by the good stallions. The fault is not always on the stallion's side, but is sometimes on the mare's side. When working hard, and not in very good condition, they are hard to get in foal. Farmers sometimes say they would not breed from a certain mare, as she was the fancy leader, and it would spoil her, but would rather breed from some old cripple that would not work. That is where we often make a mistake, as we generally make leaders of our best tempered mares. They will not last for ever, and we must breed from them to be able to replace them. My experience has been that horses bred on the place stand the hard times better than those brought from other districts.

Mares in foal can be worked up to the day of foaling, either on the farm or road work, providing they are in good condition. They should not be worked in shafts. Heavy pulling will not make a mare slip her foal, but it is very often the treatment they get from the driver that

does it. When possible, mares should have a good spell after foaling, on good feed, so as to give the young foal a chance to grow, as a foal from a mare that has been working up to time is generally smaller when foaled, but will grow well after if the mother has good feed and not worked.

We do not see the same class of horses offered for sale to-day as we did twenty years ago. When we look at the class of stallion and brood mares used on some farms and stations in the North, we need not be surprised where all the mongrels come from. How very few really sound good horses do you see in a mob picked for market from any of the largest breeders. It is difficult to get two in one hundred that will make a good pair. If we bred our sheep in the same way as we do our horses, we would find that we would get very little wool, and that of a poor quality. Where horse breeding is carried on in a large scale, any brood mare that is not sound, or did not breed a good foal, should be culled out every year, the same as is done where good sheep are bred. If that were carried out we would soon see an improvement in the class of horses sent into market. My experience has been to select a good horse by the appearance of his head and eyes, which I have found never to fail.

It is not always the fault of the horses that we do not have a good team, but very often the fault of the driver. Some men will never make drivers. When you see a farmer's team coming out of a stubble paddock with the driver on the shafts hanging on to the reins kicking and shouting for all he is worth, there must be something wrong. Horses should never be rushed or driven out of their regular pace, but they should be trained to work with the use of little or no reins. They work better than if you have to hang on to the reins all day to keep them in their place. They should be provided with a good stable to shelter them from the cold in winter and heat in summer, as they do not take so much feed to keep them in good condition as when exposed to all kinds of weather. It is better to keep eight good horses than twelve bad ones, they will take less feed and do as much work in the year. They should be groomed every day when working, it freshens the horse and helps to keep their shoulders from getting sore. The collars should be well looked after. Every farmer should be able to stuff and line his own collars, and he should know what shape will suit his horse; they should not be drawn into the shape of a new collar as is too often the case with saddlers, a new collar will never fit well; they should first be well soaked in water, then let the water drain out before using, put it on a horse with sound and well-shaped shoulders and put him into heavy work, it will soon come into a good shape. It should be flat, so as to bear evenly all over the shoulder and not draw the skin in wrinkles: if it does the shoulder will soon become sore. A hard collar will not give sore shoulder if it is the right shape, and not in hard lumps. As soon as the shoulder shows any chafing it should be seen to at once and not left until the shoulder is like a raw beefsteak.

Breaking in Colts.—Some seem to think if a man has plenty of courage and can stick to anything he can get a saddle on he must be a good coltbreaker; but he very often breaks him down instead of breaking him in. A colt should not be worked or ridden too hard to begin with, as it will not do him any good. Every farmer that breaks in his own colts should have a small post and rail yard that will hold a colt. It is not a good plan to headrope or lasso a wild colt, as it very often hurts the muscle of the neck; a better way is to have a light stick, about 6ft. long that can be used with one hand, tie a piece of bright-colored rag on one end to attract the colt's attention, and work him around the yard with that until he will let you get up to him; any colt can be caught in this way. You must be able to control your temper before you try to control a colt. If you lose your temper sit down and have a smoke, when you start work again you will find both yourself and the colt all the better for a few minutes rest. Never let a colt know that you are afraid of him, if you do it will take a long time to master him, and you might have to find a shorter way out of the yard than through the gate. Do not jump away or fall over every time a colt lifts his leg, or switches his tail, if you do he will surely keep you at it. They should be well mouthed and handled before putting them to work, especially for hacks and buggy sorts. Care should be taken not to give young horses a one-sided mouth when driving or riding them. Do not ride all over them, or lopsided like a butcher's boy, which will soon give sore backs. They should be ridden or driven with a firm rein, which helps a horse and prevents him from stumbling. Do not whip or knock a sulky colt about to get him to work, if you do he will never make a good horse; but if left until the sulks go off he will make a first-class worker. I have had colts go for four days without tightening their chains, but after they went to work they were all the better for having their own way. It is better to leave a colt until he is four or five years old before breaking him in; he will make a better horse and will stand longer than when put to work too young. They should be securely harnessed and worked with a good leader in front of them, which will prevent them from doing much harm. I have found that colts treated in this way usually give very little trouble, and, as a rule, make good workers.

Members considered that heavy draught horses are not suitable for this district, but the progeny of a cross between a draught and roadster gave most satisfaction.

Albert, May 4.

Present—Messrs. G. Holmes (chair), E. E. Hoffmann, C. Setterberg, A. Heinecke, W. H. Clarke, S. Drogemuller, J. Wetherall, W. Farleys, R. C. Rasmussen, R. C. Norton, H. L. Smith (Hon. Sec.), and three visitors.

SEED EXPERIMENTS.—Mr. Wetherall reported that Tomato *semperfructifera* was a very prolific bearer, but too small. Of the three sorts of cow peas White and Clay were only fair, while the Black was very prolific, and most suited to the district.

PRESERVATION OF EGGS.—Article on this subject from the *Journal of Agriculture*, giving particulars of method of preserving eggs in water glass, was read for the information of all concerned.

Wandearah, April 29.

Present—Messrs. G. Robertson (chair), W. Munday, W. Roberts, E. H. Eagle, T. Joyce, A. W. Davidson, W. J. Fuller, L. Stanley, C. E. Birks (Hon. Sec.), and one visitor.

CATTLE COMPLAINT.—The Chairman directed attention to heavy losses of cattle, particularly milking cows, in this district. He thought they should endeavor to have a thorough inquiry by a competent man. Considerable discussion ensued, the general opinion being that some other trouble than impaction was the cause of death in many instances. The treatment recommended by the Inspector of Stock, viz., 1lb. epsom salts 1oz. ginger, and 1½oz. gentian, in 1½qts. of warm ale, had proved successful in curing impaction. One member had cured his cows by salts alone, given in repeated doses until it causes the cows to scour thoroughly. Many cattle that have died have been opened, and no signs of impaction found. They were often only ill a few hours before death, and many quiet cows showed a tendency to rush anyone approaching them. Members could account for at least thirty deaths in this neighborhood in four months, and were of opinion that the losses during that time were fully double this. At present fewer animals are being attacked. In reply to question, Mr. Fidge stated that one of his cows had died within twenty-four hours of first sign of disease appearing, and on opening her he found the bible indicating signs of severe impaction.

Baroota Whim, May 4.

Present—Messrs. F. H. Flugge (chair.), Jas. McDougall, Alex. Spencer, Wm. Bridson, T. Simper, A. Raneburg, and C. W. Hoskin (Hon. Sec.).

FEEDING AND WATERING HORSES.—After discussion, members concluded that horses in work should be fed on good clean hay, not too much at a time, supplemented with a little crushed oats and bran. The horse should go to water before and after feeding, and when working on the farm should be fed three times a day.

Gumeracha, May 6.

Present—Messrs. J. Monfries (chair.), A. Moore, A. E. Lee, W. A. Lee, W. J. Hannaford, W. V. Bond, H. W. Nosworthy, H. J. Kramer, and T. W. Martin (Hon. Sec.).

CODLIN MOTH.—Mr. A. Moore said the codlin moth was becoming a very serious pest, and suggested that the State should be divided into two districts—the badly-infested and the comparatively clean. First, the whole of the

fruit trees in the badly-infested district should be sprayed with a strong solution of lime and bluestone whilst the blossoms were on them, with a view to totally prevent the production of fruit; and the following year the other district should be similarly treated. The owners should be compensated for the destruction of fruit at the rate of £5 per acre for full-bearing trees. Mr. W. J. Hannaford thought the time had not yet arrived for the adoption of such drastic measures; but, if the pest increases much more rapidly, the destruction of the fruit will be necessary. Every member agreed that a growing and important industry was being threatened with destruction by the codlin moth. Information was required respecting a fly, said to exist in the North Island of New Zealand, which has been reported to attack and destroy the codlin moth. [Inquiry is being made respecting this fly; but there is little to hope for in that direction.—GEN. SEC.]

QUEENSLAND FRUITFLY.—Resolved to ask the General Secretary to describe, as far as possible, the Queensland fruitfly. [Turn up the *Journal of Agriculture* for July, 1898, page 924, where you will find complete description, with excellent illustrations of both the Queensland and the West Australian fruitflies.—GEN. SEC.]

Forster, May 2.

Present—Messrs. J. Johns (chair), W. Johns, F. Johns, John Johns, A. Schumacher, J. Childs, F. Towill, J. Retallack, C. Payne, J. H. Prosser, W. Sears, C. Bolt, E. Schenscher (Hon. Sec.), and three visitors.

TROUBLE WITH STOCK.—Mr. C. Bolt read a paper to the following effect:—All the feed on the eastern side of the Murray is too fresh, and contains no salt. The drinking water is also deficient in salt, therefore sulphate of iron, bone-meal, and salt should be given to stock, in order to prevent them eating *Solanum nigrum* (wrongly called “Deadly Nightshade”) and other poisonous plants. It would also help to prevent impaction in cattle. [It remains to be proved that the *Solanum* is really poisonous. Children and birds eat the berries, and no bad results have followed. The indigenous tobacco, growing about 2ft. high, is poisonous.—GEN. SEC.]

HOW TO PROVIDE FARMS WITH WATER.—Several members think that wells give the best means for providing farms with water; but the majority favor cemented underground tanks, as wells must be sunk 200ft. and over. Mr. Johns had sunk a well three years ago, and the timbering was already fast decaying; it will soon have to be renewed, and it would have been cheaper to have made tanks. The Hon. Secretary said catchment areas could be easily made near such tanks by cementing the adjacent sandy soil with lime.

Kadina, May 2.

Present—Messrs. F. H. Warren (chair), S. Roberts, D. F. Kennedy, H. Johnson, Peter Roach, S. Small, J. W. Taylor (Hon. Sec.), and two visitors.

FIELD TRIAL SOCIETY.—Paskeville Branch advised that at their latest meeting the following resolution was carried:—“That, in the opinion of this Branch, it is desirable to request the Northern Yorke’s Peninsula Field Trial Society to communicate with the makers and importers of complete harvesters with a view to giving a working exhibition at Paskeville early next harvest. Suggest that no prizes be offered, but every farmer judge for himself. The Paskeville Branch is prepared to provide all teams and drivers required, and take machines from and to station free of charge.” After discussion it was

decided to support the Paskeville Branch. The suggestion of Pine Forest Branch, that a trial of seeding implements be held in July, was also discussed, but members generally thought it would not be a success.

POULTRY.—The Hon. Secretary read a paper on this subject to the following effect :—

If keeping poultry is to be a pleasure and profit, the poultry-keeper must make up his or her mind to give a large amount of time and attention to their proper care, as only clean and comfortable quarters and regular feeding can secure healthiness and profit, laying and fattening. Regarding the choice of fowls, too much stress cannot be laid on the error of supposing that mongrels or mixbreed fowls are more useful than pure breeds. In the large variety of breeds available to the fancier there are certainly some which are more generally useful, being hardy, more fleshy, and more prolific in breeding; and these special breeds it is well for the poultry-keeper to secure; but to carelessly mix the breeds as a general principle, so as to purposely deteriorate the stock, is an evident error. On the other hand, when done judiciously the intermingling of two, or even three distinct breeds will often secure an all-round good and useful bird, which will combine the egg-producing faculties of one and the hardiness of another; but this can only be done by experienced fanciers after much study and care. A well-known authority classifies the chief breeds of poultry for economic purposes in the following manner, the order of naming representing what he considers their comparative value :—For laying, the Hamburgs are named first, followed by the Minorcas or Andalusians, Houdans, Brahmas, Leghorns, Spanish, Polish Dominiques, Game, and Cochins. For the quality of their flesh he names in their order—Game, Dorkings, Houdans, Polish, Brahmas, and Dominiques. For size and weight—Brahmas, Cochins, Dorkings, and Malays; and for hardiness Houdans, Brahmas, Dominiques, Cochins, Minorcas, Andalusians, Leghorns, and Game; whilst for hatching purposes he names Dorkings, Game, Dominiques, Brahmas, and Cochins, and for a combination of useful qualities he recommends Dominiques, Houdans, and Brahmas, and giving the palm for general utility in ordinary circumstances to the Dominiques. Where poultry is reared simply for the market the Dorking is given as the best fowl, as it fattens easy, grows early, and looks well on the table.

Mr. Kennedy thought sufficient attention was not usually given to poultry. In his opinion poultry-keeping was one of the most profitable industries connected with the farm. Mr. Malcolm supported. In his opinion the Brown Leghorn was the best all-round fowl. There was great difficulty in keeping the breeds pure if two or more kinds are kept, as the birds must have plenty of run to be profitable. He found broken shells from the seashore, also roasted eggshells, valuable for the birds. If the fowls showed symptoms of diarrhœa, he gave Epsom salts in water.

Koolunga, May 7.

Present.—Messrs. T. B. Butcher (chair), J. Button, E. J. Shipway, R. Lawry, J. Jones, J. Freeman, G. Cooper, J. Sandow, J. Butterfield, R. Palmer, J. C. Noack (Hon. Sec.), and one visitor.

QUESTION BOX MEETING.—Various questions were asked. *Cure for Greasy Heels*—Mr. Freeman used a paint of white lead and linseed oil. Mr. Cooper found bleeding at the proper places and applying burnt alum and ointment effective. Mr. Palmer used common gunpowder instead of alum. *Time to Water Horses. Before or After Food*—Opinions on this point were much divided. It was suggested that some horses do better watered before meals, and others after meals. *Feeding Cows.*—In reference to feeding to produce milk, one member advocated bran and chaff, while others questioned whether such feeding would pay at present price of bran.

DELIVERY OF MANURES.—The question of earlier delivery of manures was warmly discussed. It was thought that united action should be taken by the Branches of the Bureau generally, and only those firms who are found to be punctual in delivering supplies be patronised.

AGRICULTURAL PLOTS—It was decided to again offer certificates for best kept agricultural plots in the district.

Nantawarra, May 1.

Present—Messrs. Jas. Nicholls (chair), H. J. Spencer, R. Uphill, E. J. Pridham, E. J. Herbert, A. L. Greenshields, J. W. Dall, G. Belling, T. Dixon (Hon. Sec.), and one visitor.

FIELD TRIAL.—The Branch supports suggestion of Paskeville Branch that the Bureau Field Trial Society should arrange for trial of harvesters at Paskeville early in the harvest season.

PREPARATION OF LAND FOR SEEDING.—Mr. G. Belling read a short paper on this subject. No hard-and-fast rule as to how any farmer should prepare his land can be laid down. If they expected to get the best return for their labor they must fallow early, commencing operations as soon as tilling is finished. Fallowing should be completed in this district not later than second week in August, which will give them time to work it down fine. The depth to plough will depend upon the nature of the subsoil. Light scrub land with rubble bottom should be ploughed 3in. to 4in., but sandy loam, or stiff clay, may be turned over to depth of 5½ins. With deeper ploughing the fallow should be harrowed down with set of heavy harrows. The scarifier, or cultivator, should be set going if any weeds spring up. Weeds growing round the fences, or missed by the scarifier, should be fed down by sheep. After summer rains the fallows should be harrowed. After autumn rains eight or ten days should be allowed to elapse to allow the seeds to germinate, then put the cultivator into the ground again, follow with a light set of harrows, and the soil will be ready for the drill. Mr. Dall asked when was the best time to harrow after fallowing. Some members would do it immediately after ploughing, as the land was pulverised much easier, but others would wait a little to allow any seeds in the soil to germinate. Much, however, depended upon the weather and the soil. Mr. Dall also wanted to know reason for rolling the fallow in the summer, and if it was beneficial. He thought it was often done to break the clods, and because the land had not been properly worked previously, but left in a rough condition. Members were not sure why this was done, the practice not being in any way general in this district.

PRICKLY PEARS FOR FENCES.—Mr. Dall drew attention to the possible value of the prickly pear for fences where the sand was inclined to drift. It is easy to grow, stands any amount of dry weather, and makes a fence that no stock will go through. Mr. Uphill pointed out that this plant had become a nuisance about Rhynie, spreading over the roads until only a narrow passage-way was left. [The prickly pear (*Opuntia*), properly looked after, would be a very useful live fence in sandy localities, but, if neglected, will become a great nuisance. The question is, would farmers trim the hedges regularly and so keep it from spreading? The "leaves," when divested of thorns by singeing, are valuable food for all kinds of farm stock.—GEN. SEC.]

MANITOBA WHEAT.—Mr. Pridham asked why Manitoba flour brought more than the colonial article. It was pointed out that the difference in price was probably due to the fact that three grades of flour were made and only the best exported.

Hawker, May 1.

Present—Messrs. S. Irvine (chair), J. Hill, J. Moller, H. M. Borgas, A. C. Hirsch, R. Wardle, F. C. Hirsch, and J. Smith (Hon. Sec.).

ELECTION OF OFFICERS.—Mr. J. Smith was re-elected Hon. Secretary, and Messrs. H. M. Borgas and R. Wardle elected Chairman and Vice-chairman, respectively, for ensuing year, a vote of thanks being accorded to the officers for their past services.

QUESTION BOX.—Mr. Irvine suggested the adoption of the question box as a means of increasing the interest taken in the Branch. There were many small matters that the general public would like information on which would be submitted through a question box. Where the members were unable to supply the desired information the matters could be submitted to the General Secretary. Other members agreed, and it was decided that the Hon. Secretary should obtain a box and fix it in a place where it would be easily seen.

Crows.—Mr. A. C. Hirsch thought most farmers failed to recognise the full extent of the mischief done by crows or they would make greater efforts to destroy them. They took large quantities of eggs and chickens, picked up the wheat at seeding, and killed lambs at every opportunity. Farmers should make it a point to destroy every crow they can get hold of. Members agreed with Mr. Hirsch, but considered the crow knew too much for them. They appeared to know when a man had a gun, and poison seemed to be ineffective.

Lucindale, May 4.

Present—Messrs. E. Feuerherdt (chair), G. C. Newman, H. Langberg, A. Carmichael, B. A. Feuerherdt, and E. E. Dutton (Hon. Sec.).

FAT STOCK FOR MARKET.—References was made to losses to South-Eastern stockowners occurring through delays in getting stock to market, and it was decided to invite the co-operation of other Branches in endeavoring to secure improvement in railway facilities.

Wilmington, May 6.

Present—Messrs. W. Slee (chair), J. Schuppan, M. Gray, J. Hannigan, A. Maslin, F. Bauer, H. Noll, R. Cole, J. McLeod, J. Lauterbach, and R. G. S. Payne (Hon. Sec.).

MANURING.—Considerable discussion took place on suggestion in circular from the General Secretary that Branches should endeavor to have the question of relative values of heavy and light dressings of fertilisers for wheat tested during the coming season. Members thought the experiment being carried out by Mr. Schuppan with fertilisers received from the inspector of fertilisers, in varying quantities up to 1½ cwt. per acre, would be a fair test. Mr. Slee proposed to adopt the suggestion of the General Secretary on small plots, but he intended to cut the crop for hay.

BUNT.—Mr. Hannigan read a short paper on this subject. He contended that if seed wheat was properly pickled with bluestone solution, using 3 lb. bluestone to the bag of wheat, and greater care taken to bring every grain in contact with the solution, there would be fewer complaints of bunt in the crops. Considerable discussion ensued on the paper.

Kapunda, May 4.

Present—W. Flavel (chair), Pat Kerin, J. H. Pascoe, J. O'Dea, Peter Kerin, T. Scott, C. P. Weckert, R. B. Banyer, H. T. Morris, and G. Harris (Hon. Sec.).

CARRYING CAPACITY OF FARMS.—Mr. O'Dea referred to paper read at previous meeting by Mr. O'Sullivan on "How to Increase the Carrying Capacity of the Farm." He thought there need be no fear but that the price of drills would soon be reduced. He was glad to note that many who opposed the use

of the drill a few years ago were now advocates of it. He agreed with Mr. O'Sullivan as to the growing of green fodder, the conservation of wheat chaff and other food stuffs often neglected. It behoved every farmer to save his wheat chaff, as if not needed at once it would come in useful at some later period. A shelter shed in the paddock was a great boon to stock in the winter months. When stock were not hard worked, he thought wheat chaff would do the horses no harm. He had seen it used years ago in the South-East. He favored the use of crushed corn during the winter, and thought horses usually suffered more from the want of, than from the effects of corn. Several members had known horses eat at the wheat heap during harvest time and suffer no ill-effects. They seemed to get used to it, though it would probably be dangerous to allow them to get a drink just after feeding.

Holder, May 4.

Present—Messrs. J. Rowe (chair), H. W. Perry, E. Crocker, W. Wood, H. Blizard, F. G. Rogers, S. Pickering, H. Tuck, F. Starr, J. Green, H. J. Rossiter, and J. J. Odgers (Hon. Sec.).

COW PEA.—Mr. Green reported that cow pea had grown well with him.

POISONED RABBITS.—A member asked whether rabbits poisoned by phosphorus baits were fit for human food, and how long after death before the phosphorus affected the flesh. Members were of opinion that it would be dangerous to use poisoned rabbits at any time. [Surely such a question is unnecessary. Whoever would think of eating poisoned animals?—GEN. SEC.]

PIG-BREEDING.—Mr. Green read the following paper on this subject:—

After a few years' experience in pig-breeding, I have come to the conclusion that it is a paying industry, providing not more is kept than can be properly fed. A good boar and two or three roomy sows will repay the breeder for his time and trouble. A good many persons favor the Essex boar and Berkshire sow, but I have found that white pigs do not thrive so well as the black when they are confined in sties. The whites require exercise, and, situated as most of us are, that is not always possible. I favor the Berkshire boar and any roomy, lengthy sow. The boar should be deep in the body, and not too broad in the back, and stand well up on his hind legs. Never put a sow with a boar that has got his feet tucked under his body. The Berkshires have always been found to do well in sties; they seldom get too fat, and they will put on the most flesh with the least amount of feed, and that is a most important item. Pigs thrive well on pie-melons with a little wheat fed twice a day, and occasionally a little lucern or maize, or in fact any green fodder that is on hand, a bucket of wood ashes occasionally, and above all, plenty of water. I do not say the above makes a pig fit for first prize at a cattle show, but strong, healthy pigs. The best time for farrowing is October, as the weather at that time is not too hot, and the young pigs get to a nice handy size by May or June. Separate the sow a week before farrowing, and give her one or two feeds of bran and pollard, and do not give her any food for twelve hours after farrowing, and then a warm bran mash. When the little pigs are fourteen days old give them a small trough to feed apart, as it relieves the mother and improves the little ones wonderfully. Wean them at five to seven weeks, and castrate all male pigs when they are about six weeks old.

Considerable discussion ensued, members generally being of opinion that pigs weighing about 80lbs. were best for market. The Berkshire was found to do well in this district.

Elbow Hill, May 5.

Present—Messrs. H. T. Styles (chair), E. Wake, H. Dunn, C. G. Ward, C. L. DuBois, J. Harvey, W. L. Benke, and G. Wheeler (Hon. Sec.).

DAIRYING.—Arrangements were made with object of securing a good dairy bull for service in the district. It was decided that the purchase of a bull be made by the members, and the animal be the property of the Branch. It was

decided to let the matter of the purchase of a draught stallion stand over for twelve months.

PACKAGES FOR SUPERPHOSPHATE.—The question of condition of packages containing superphosphate evoked much discussion. The Branch expressed itself strongly against the use of bags, as considerable waste resulted, and hoped that other branches would unite with them to get some other package adopted. It was suggested that strong cases would be much better than bags. [Members must remember that whatever package is used the farmers will have to pay for it. Cases or casks would cost far more than bags, and would occupy more space in the ship, causing freight to come higher per ton of manure. Large quantities of super. come to hand in splendid condition, and if the buyers make it a part of their contract with the importers that the manure is to be delivered in sound packages they can refuse to accept damaged bags.—GEN. SEC.]

ANALYSIS OF SOILS.—Mr. DuBois referred to question of cost of obtaining analysis of soils, and it was resolved that the Branches of the Bureau be asked to consider the matter with a view to endeavoring to induce the Government to reduce the charges.

Golden Grove, May 2.

Present—Messrs. J. R. Smart (chair), S. A. Milne, A. Harper, F. Buder, W. Mountstephen, A. Robertson, and J. R. Cole (Hon. Sec.).

PEARS.—Mr. Buder tabled samples of the following pears, which had been stored for two months:—Glou Morecau, Josephine de Malmes, L'Inconuc, Broom Park, Winter Nelis, Winter Cole, Madame Cole, Beurre Deil, and Backhouse Bergamot. The last-named had not kept so well as the others, which were in excellent condition. Mr. Buder found Winter Nelis the shyest bearer of all.

Paskeville, May 4.

Present—Messrs. A. Goodall (chair), J. P. Pontifex H. Koch, A. C. Wehr, T. H. Price, R. Hamilton, W. Westphall, A. Palm, G. Meier, J. C. Price, and W. S. O'Grady (Hon. Sec.).

FIELD TRIAL SOCIETY.—The Chairman reported that the land obtained from the Government for the Field Trial Society had been well fenced by the Branch, and was available for trials of machinery and implements.

ANNUAL MEETING.—It was decided to celebrate the tenth annual meeting of the Branch in July, by holding a social gathering and planting some forest trees.

Colton, May 4.

Present—Messrs. P. P. Kenny (chair), E. Whithead, Jno. Shipard, W. J. Packer, M. S. W. Kenny, B. A. McCaffrey, R. Hull (Hon. Sec.), and one visitor.

DIEBACK OF FRUIT TREES.—Mr. Packer read an extract from a Victorian paper dealing with this subject, the trouble being attributed to some deficiency in the soil and not to any particular disease. Deep working and enriching of the soil was advocated in order to provide the roots with food. Considerable discussion ensued, the necessity for thorough working to encourage deeper rooting being mentioned, and the peculiarities of various parts of the district in respect to the growth of trees and vines referred to. Members were agreed that it was useless to attempt to grow fruit trees near the coast in this locality unless a good breakwind is provided. Thorough working was strongly advocated.

KING'S EARLY WHEAT.—Members were greatly surprised at Professor Lowrie's statement that, under present conditions, it was more profitable for him to grow King's Early wheat at 2s. per bushel than varieties of higher milling qualities at 2s. 6d. The experience with this variety on the West Coast is just the reverse. King's Early had proved bad to reap and clean, while the agent for the Farmers' Co-operative Union had informed the growers that it was of little value for export.

DAIRYING.—Offer of a pure-bred Shorthorn bull of good milking strain was received and consideration deferred.

EARLY WHEAT.—The Hon. Secretary wished to know whether any members of other Branches had had wheat to come into ear in May or June and how it had turned out, and if fed down by sheep did the crop return as much grain as later sown crops.

Mount Remarkable, May 2.

Present—Messrs. C. E. Jorgensen (chair), T. H. Casley, W. Lange, G. Yates, J. B. Murrell, T. P. Yates, W. Morgan, T. J. Spratt, J. O'Connell (Hon. Sec.).

BOULEROO CENTRE BRANCH.—Members desired to know reason for absence of reports of meetings of Bouleroo Centre Branch from *Journal of Agriculture*. [Bouleroo Centre Branch is asleep, and requires to be awakened. ... would be of the members sufficient interest in the work of the Bureau to take ... position is in hand?—GEN. SEC.]

ROLLING LAND.—The Chairman read article from April *Journal of Agriculture* on this subject. Members were unanimous that rolled land would be very much proved by running a light set of harrows over it. Members were also of opinion that growing crops would be much improved if harrowed, especially if done just before rain.

PRICE OF WHEAT.—Members agreed that a great injustice was done to farmers who were careful to have a good sample of wheat, inasmuch as buyers, while particular in docking any that did not come up to the standard, only gave ordinary price for wheat much above the standard.

SILOS AND ENSILAGE.—Mr. Casley read the following paper on this subject:

Everyone who has had any experience with ensilage has some pet ideas on the subject. The construction of the silo was the first consideration. What is wanted is a silo that can be constructed and filled by any farmer. I say any farmer, because I consider the farmer that has cows that are worth keeping should not be without a silo. The first and main thing to select is a suitable spot of ground that can be used for that purpose, and securely fence it all round. Some people advocate the side of a hill, but some farmers have no hill; to those I will try to explain my methods of building, &c. Having fixed on the site, which should be near the cow yards and not too close to the separating room, excavate one pit 26ft. long, 13ft. wide, and from 13ft. (not less) to 16ft. or more deep, if water will permit sinking to that depth. This will, when built up with bricks, leave with a 9in. partition wall across the centre, two pits 12ft. square. Most silos are oblong, but I like square ones, because your boards fit both ways. Some also advocate stone walls, and almost any stone will do, providing the walls are cemented and made perfectly plumb. I recommend bricks, because no cement is required, and when built plumb, with good mortar, the faces of the walls are just as good as cement; and the amount of loss through the want of being cemented will be very small. The walls should be built to ground level of single bricks; above the ground 9in. brick work, about 4ft. high one side, 5ft. the other. The fall can be any way, and most suitable. About 2ft. above ground build in pieces of old wheel tires with $\frac{1}{2}$ in. hole in the ends to admit bolts to hold down roof, let them project about 3in., the hole $\frac{1}{2}$ in. from ends, eight pieces of tire 1ft. long split half-way lengthwise, and turned outward to form a 'T'. The roof should be made (in two pieces for each pit) of 24-gauge iron on light material; 3in. x 1in. deal is quite good enough, fastened with short screws. The halves should be made so that the iron projects over one side to lap on the other half. Twenty-eight sheets of iron will cover the two pits. When the

roof is on, four pieces of 3in. x 2in. or larger, will be required to hold the roof on, with bolts to reach right through plates built in walls to receive the same. Some advocate tramway principle for roof, but such a system is beyond the ordinary farmer. All concrete for the floor should be made rich and the mortar for walls should be of the best; to use poor stuff is only waste of time. Any intelligent farmer will know what makes good ensilage; my experience is that what a cow will eat green she will also eat if converted into silage. The following mixture I have found good after being in the pit for four years:—Barley, wheat, oats, rye, rape, and dandelion, cut at least four hours before put in the pits long, but if chaffed into pits nearly twice the amount can be put in—in filling with long stuff it must be continually trampled down round walls. In filling I always half fill one pit first, then the strain on the partition wall is not too much. Weight it down and go on with the other pit, and *vice versa* until filled. The boards to cover silage should be 9in. by 1½in. deal or oregon, 1in. less than the pit, so as to work freely. For weights, I find kerosene tins filled with clay, we'd first to the consistency of pug, and then well pressed into tins. Strong fencing wire for handles; put as many as can be jammed in without being too close to lift out easily. The most economical contrivance I find for either lifting weights or taking out silage is a common windlass on good strong bearers right across the pit, boarded over so as to walk on, for landing stuff, &c. Silage should not be fed to cows directly it is taken out of pits—about one hour at least before feeding. I know many so-called farmers and cattle raisers and dairymen that are in a position to build first-class and up-to-date silos, but instead, would rather go on without them, with the result that in times of scarcity their milking cows and cattle are simply walking shadows; and, to quote the words of a large and prosperous dairyman, who used silos to the best advantage, he says until silage is in *every dairy* dairying will not pay, and in dairying lies the prosperity of Australia. Until the land is put to better use the people will be poor. Every twenty shillings taken from the land is twenty shillings added to the wealth of the State. It is not twenty shillings taken from someone else but twenty shillings actually earned. If any farmer that has hitherto done without a silo will at once make one he will be surprised at the result. I would advise all that are in a position to keep, say, only six or eight cows to build a silo at once to receive the next green feed that is available.

Morphett Vale, May 6.

Present—Messrs. Hy. Smith (chair), A. Jones, J. Depledge, T. Anderson, J. McLeod, F. Hutchinson, A. Pocock, and A. Ross Reid (Hon. Sec.).

SUMMER FEED.—Messrs. Smith and Hutchinson strongly recommended sowing the following mixture, viz., rape, tares, and Cape barley, in February, for feed for early lambs. About 1bush. per acre of the mixture (half being barley) should be scarified into the stubble. This will also make good ensilage.

SHEEP ON FARMS.—The Hon. Secretary initiated discussion on this subject by reading a few notes on "Sheep," to the following effect:—

As a rule it does not pay a farmer to try and deal in sheep as many do. They buy sheep from the North, bring them down here, and the sheep very probably go back in condition, and the owner loses money. The most profitable thing for any farmer in this district is fat lambs. They must generally be satisfied to buy old sheep, as the young ewes in the market are usually inferior, so get good full-mouth ewes and take say a couple of seasons out of them, then sell again as fat as you can get them. Do not mind paying a fair price for a ram, and do not make the mistake of letting him run all the year round with the ewes. Either have a small pen and hand-feed him, or get some one to paddock him who has a flock of rams. Put the ram with your ewes about December 1, and take him out in April. It will pay any man who puts in 100 acres every year, and has 100 fallow, to keep sheep. If he cannot keep more, thirty ewes and a ram will generally return twenty-seven or twenty-eight lambs, and frequently more. Now these lambs will fetch about 8s. or 9s. each, and if extra prime, up to 12s. The wool off the ewes is another item, and even at present prices would return about 4s. per sheep, or say 12s. for the wool and lamb per ewe, which on thirty ewes is £18, which at present represents a small stack of hay. They will keep the weeds down, and a harrowing will do for the fallow instead of a scarifying. The cost of sheep-proofing is not much. A three-wire fence around a section would require say four more wires, which only means about £1 6s. a wire besides labor. About £8 would pay wire and labor to make a whole section sheep-proof, and this would be returned the first year. It can be nothing but profitable and the cost is small, and I urge everyone with three or more sections to try it.

The Chairman strongly recommended farmers in the district to keep sheep whenever it was possible to do so. Members generally agreed that sheep were profitable on the farm.

MANURES.—The Chairman said he found from experience that for feeding purposes hay from manured land was superior to that grown on unmanured land. In this district very little wheat is left for grain, nearly all being cut for hay. Very little land is sown unmanured. The Chairman, whose crops are reputedly equal to any grown in the neighborhood, states that he has used manure in varying quantities, from 2cwts. super. up to 2cwts. of super. and half a ton of bonedust per acre. He had also put 2cwts. of super. per acre after stable manure, and was strongly in favor of heavy manuring. For prompt returns he considered 2cwt. per acre a good dressing. It was absurd to sow 70lbs. to 80lbs., as there was all the extra labor and cost of drilling and only a partial increase in the crop. He had never known his heavily manured crops to blight. Two members undertook to carry out experiments with different quantities of manure per acre, as suggested in circular from Central Bureau.

Mylor, May 4.

Present—Messrs. P. P. Probert (chair), W. H. Hughes, W. Nicholls, W. J. Narroway, T. J. Mundy, J. Nicholls, C. Neilson, A. J. Wilson, W. G. Clough (Hon. Sec.), and one visitor.

HILLS CONFERENCE.—It was decided to hold the Annual Conference of Hills Branches at Mylor on September 26, and a committee was appointed to make all necessary arrangements.

CIDER-MAKING.—Mr. Jno. Nicholls read a short paper on this subject. Rough tasting apples are generally preferred, and the fruit is not gathered until it is thoroughly mature. The apples are usually stored for about two weeks in a barn or loft to mellow before the juice is expressed. The apples are ground to a pulp, which is put in coarse bags and placed under heavy pressure. The juice is put into open vats or tubs, and kept at about 60° F. for two or three days for weak cider, and eight to ten days if strong cider is desired. As soon as the sediment has settled the liquor is racked into clean casks and stored in a cellar, shaded barn, or other cool place where a low and regular temperature can be maintained. In the following spring it is mature, and is again racked for use. The refuse pulp makes an acceptable food for pigs and store cattle. Mr. Probert said he was informed by his father that in England a certain proportion of an apple called Bittersweet was necessary for the manufacture of good cider, but Mr. Nicholls had made good cider from various kinds. Mr. Hughes said he had tasted first-class cider made in South Australia.

EXHIBITS.—Mr. Wilson tabled fine samples of apples, and Messrs. Probert and Nicholls samples of Kaffir corn grown from Bureau seed.

Woolundunga, April 30.

Present—Messrs. J. Grunike (chair), J. H. Michael, T. H. Prosser, J. O. Walker, G. Foulis, N. Rogers (Hon. Sec.), and one visitor.

SEED EXPERIMENTS.—Mr. Aldenhoven reported that Formosa and Japanese Climbing cucumbers from Bureau seeds were shy bearers, and not profitable for this locality. He also tabled magnificent sample of Sea Eagle peach. He, in common with others in the district, had suffered severely from the ravages of birds, especially ringnecked parrots.

MEMBERSHIP.—The Hon. Secretary reported that Mr. A. S. Gunning, who was leaving the district, had presented to the Branch a handsomely framed drawing as a memento. Members regretted to lose Mr. Gunning, and accorded him a hearty vote of thanks for his thoughtfulness.

TOMATO-GROWING.—Mr. Foulis read a paper on "Tomato-growing for Early Fruit." Seed should be planted in sand about the middle of March; when they come up thin out the plants in order to get good strong growth. Transplant about end of April when plants are 5in. to 6in. high, watering at once, and keeping them watered until they commence to grow again. Plant in drills 5ft. to 6ft. apart; strong, quick-growing varieties should be about 2ft 6in. apart in the drills. Make the beds about 22yds. wide, and brushed on each side to shelter them from the north and south winds. When the vines begin to run load the leaves with soil to prevent them blowing about. The ground should be kept loose as long as possible. Grown under these conditions he had picked ripe tomatoes on October 12, and had in the season gathered 387 fruits from one vine.

Cradoek, May 4.

Present—Messrs. P. Gillick (chair), B. Garnet, T. Marsh, W. Haggerty, J. Turner, J. H. Lindo (Hon. Sec.), and one visitor.

RABBIT DESTRUCTION.—Considerable discussion on this subject took place. Mr. Gillick found toxa about the most effectual poison, but it was too costly. Cyanide of potassium with sugar and water, carefully set out fresh every day, was the cheapest and best in summer time. Mr. Garnet found strychnine, sugar, and water effective in summer time, and bisulphide of carbon in the burrows in winter very successful. Mr. Marsh found bisulphide of carbon the best thing for destroying rabbits in the burrows, but every care must be taken to close up all vents such as blow holes, cracks, spider holes, &c. The Hon. Secretary agreed: he found cheap apple jam mixed with a little strychnine very effective outside the burrows.

Burra, May 10.

Present—Messrs. F. A. S. Field (chair), F. Duldig, Jos. Flower, E. Goodridge, A. McDonald, W. G. Hawkes, and R. M. Harvey (Hon. Sec.).

SHEEP ON FARMS.—Members were all agreed that it was advantageous to keep sheep on the farms, the practice being very general in this district.

WINTER WORKING OF FALLOWS.—Mr. McDonald read the following paper on this subject, which met with the approval of all present:—

Everyone who has to do with wheat-growing in the Middle North must have observed the superior working which most farmers give to their soils since the advent of the seed-drill. That this better working of the soil has been very profitable there can be no doubt. It is then an important question, how much improvement can still be made in these methods? I consider that much better crops than at present can be secured at very little increased cost by fallowing earlier and avoiding as far as possible dry working of the land. Fallowing, to be called early, must be begun early in June, and the ploughing finished by the end of July. A harrowing and cultivation should be given during August. This, in average years, will give a big growth of weeds to be killed by the cultivator about the end of September, after which the land should be harrowed that it may present as little surface as possible to wind and sun. Any weeds showing during the summer should be kept down by the sheep, and in the event of a heavy fall of rain occurring through the summer, and patches likely to set hard should be loosened if possible. The main reasons for this practice are the getting through the soil and into the subsoil the greatest possible quantity of the water that falls on it during the winter. The greatest quantity of work is done when the soil is in the best state, and the maximum of work can be done at the minimum of cost. Weeds will germinate and can be killed in the spring, which is not the

case with late fallows, or without surface fining. Neither the first nor the second of these reasons seem to get the attention which their importance warrant; but to get the soil in best condition work must be begun early. A practice that is in accord with the second also accords with the first, and the second only need be considered. Different soils are not at their best condition with the same amount of moisture, a light soil working well with an amount that would be too much in a clay. A soil can be considered in the best condition when its particles divide most readily into the size most suitable for the absorption and retention of moisture. It may be mentioned that a soil in the best condition for absorbing water is in the best condition for retaining it. It can generally be said that the finer the soil the greater its capacity to absorb moisture, but there is a limit to the fineness to which a soil should be brought. A German experimenter found that a garden loam capable of absorbing 114 per cent. moisture in its natural state, when brought very fine would only absorb 62 per cent. The reason of this is that the water a soil will absorb depends on the number of pores or air spaces it contains of a certain size. It follows that a soil in which the pores are small and numerous will soak up more water than when they are large and few in number. If, however, a soil is too fine, the air spaces are too small and the soil becomes too compact. This last condition is often present in a soil worked too dry, a portion working into a fine powder, and compacting together after heavy rains. The importance of condition in a soil becomes apparent when it is remembered that a soil worked in condition will largely retain it during the whole growing season, and in seasons when the rainfall is slight give a yield bushels in advance of one not so carefully worked.

Robertstown, May 6.

Present—Messrs. N. Westphalen (chair), A. Day, W. Farley, J. E. Milde, A. Rohde, T. Hagley, H. Rohde, and S. Carter (Hon. Sec.).

WHEAT EXPERIMENTS.—Mr. A. Rohde reported having last year sown half a bushel of Bartlett's Crossbred wheat, and reaped 4bush. Seed was sown unpickled, the result being a few bunt balls in the grain. Three pounds of Marshall's Hybrid wheat only yielded 12lbs. Mr. Hagley sowed 2½lbs. Ranjit wheat, and reaped 14lbs.; the grain was good, the heads long and thin, and the straw thin. The Chairman tabled specimen of wheat with two distinct heads on one stem.

SHEEP FOR FARMERS—A discussion took place on question as to whether sheep or cattle were more profitable to small farmers. The scarcity of water and the prevalence of dogs were drawbacks to the keeping of sheep in this district, though it was agreed that where the farmer possessed the necessary conveniences sheep would prove a source of profit.

Belair, May 4.

Present—Messrs. O. Nootnagel (chair), H. Halstead, Jno. Halstead, G. Wescombe, G. Rossini, W. J. Bartlett, and G. R. Laffer (Hon. Sec.).

CODLIN MOTH.—A long discussion took place concerning the codlin moth regulations, and it was finally resolved that this Branch protests against the proposed alteration of the regulations relating to the sale of infested fruit, and considers it would be detrimental to the apple industry to allow the indiscriminate sale of infested fruit.

WINTERING BEES.—Mr. Nootnagel read the following paper on this subject:—

Now that the honey season has closed the colonies will require some little attention prior to shutting down hives for the winter. See that each colony has a good stock of sealed honey in strong old combs, sufficient to rather more than last through the winter, for sometimes swarms, after successfully getting through the winter months, desert their hives in the spring on account of shortage of stores, perhaps more often from this than any other cause; therefore, leave them plenty. My bees have always all that they store in the

bottom story, and often additional full frames in the next story, consequently, in the following season the hives soon get full of bees, and I am enabled to start extracting early. With regard to keeping bees warm during the coldest months of winter, I do not think that any artificial heat is necessary in this State, but over each brood-chamber should be placed a piece of duck or American leather, the glazed part downwards, which is all that is necessary, excepting perhaps in some few of the coldest of the Hills districts, when a chaff mat can be placed over the other mat. The entrance to the hives should be regulated and kept clear of dead bees, fallen twigs and leaves, grass, &c, otherwise they often get completely clogged. The roofs of hives should be quite watertight, it being a good plan now to putty up all cracks and crevices, and give two or three coats of paint, white zinc for preference, but do not mix any dryers with the paint. Should any water drip through the roof on to the frames, they will be deserted by the bees and become mouldy, with the cells very often holding quite a quantity of water. If any of the colonies are very weak, two or more may be united, and if deficient of stores, frames full with sealed honey taken from hives which are well supplied, given to them. Others may have their brood-chamber contracted to conserve warmth by placing a division board in the brood-chamber, so that all frames are well covered with bees, *i.e.*, if in the brood-chamber there are ten frames, and only six of them are covered with bees, the four uncovered frames may be removed and the division board placed next to the sixth frame, then the warmth given off from the bodies of the bees will warm the smaller chamber, none of it going to waste in warming the vacant space previously occupied by the four empty frames. In wintering, the principal points are well-covered frames in the brood-chamber, a sufficiency of sealed honey, and a weather-tight hive; and having secured these three conditions the apiarist need have no fear of dwindling and loss of colonies.

Eudunda, April 29.

Present—Messrs. F. W. Paech (chair), F. W. Sieber, H. D. Wiel, H. Hage, C. Pfeiffer, J. A. Pfitzner, C. Wainwright, A. M. Twartz, and W. H. Marshall (Hon. Sec.).

MANURES.—The Hon Secretary read a short paper containing some useful hints in reference to use of manures. Members wished to know whether anyone had tried mixing superphosphate with sheep manure, and with what result; also whether in the event of the phosphates remaining in the soil for a time without there being sufficient rain for the seeds to germinate, would the manure lose its fertilising power. [Sheep manure and super. mixed have been used, and probably members of other Branches may be able to answer the above inquiry. There would be no loss of fertilisers owing to dry weather.—GEN. SEC.]

WHEAT EXPERIMENTS.—Mr. Twartz tabled samples of Ranjit, Majestic, Marshall's Hybrid wheats, all fairly early, and Silver King, a late variety, grown from seed received from the Bureau. All were promising, the grains being nice and full, and the returns from 10bush. to 12bush. per acre.

Hartley, May 1.

Present—Messrs. W. Klenke (chair), J. Jaensch, A. Jaensch, H. Reimers, A. Thiele, and B. Wundersitz (Hon. Sec.).

TREATMENT OF HORSES.—Members generally agreed that if horses have trotting work to do it was better to water before meals, as if watered after feeding they were almost sure to scour. For slow farm work, however, it did not make much difference. They should not be watered when very hot from working, nor should they be allowed to get cold first. A warm stable with plenty of ventilation was necessary. They should be groomed well, the oftener the better, as they will do much better work than those not groomed. It is a good plan to have a yard in front of the stable so that the horses can move about as they please. If tied up in the stable for a day or two after working they are

apt to get swelled legs. Horses should get five meals a day, and only a little at a time; if feed is given in large quantities, it is, to a certain extent, fouled by the horses. Barley was considered unsuitable for feeding, as it makes them itch and causes a rough coat. Oats was the best grain, and should be crushed if the horses have not much time to eat, as otherwise they would probably swallow a lot whole and so lose the full benefit of their feed. Fast and slow moving horses should be worked in separate teams. The collar should fit the shoulders properly. Mr. A. Jaensch found it beneficial to line the collar with sheepskin, wool inside. In case of sore shoulders, wash with cold water immediately the collar is removed and while the shoulder is still warm. A new collar should be soaked overnight in water, then put it on the horse and work for a day. The collar will then fit the horse's shoulders, and should on no account be used on another animal. If the collar is well oiled the water will not injure it.

Richman's Creek, May 6.

Present—Messrs. W. Freebairn (chair), A. Knauerhase, P. J. O'Donohue, A. J. Knox, J. J. Searle, J. J. Gebert, W. J. Wright, F. Mattner, J. M. Kelly, J. McSkimming, J. McColl (Hon. Sec.), and two visitors.

VEGETABLES ON THE FARM.—Mr. Mattner tabled large pie melon grown on his farm. He had a small dam near the garden that was filled by a thunderstorm early in March, and from this he watered his plants. He had grown turnips this season as large as an ordinary cup. A small dam with a good catchment would often enable a man to grow a few vegetables for the house where none could otherwise be grown. Manure from the cowyard or pigsty was better than horse manure for vegetables, the latter appearing to cause blighting. Old wheat chaff put round turnips as a mulch was a good thing to keep the ground moist. Mr. Knauerhase said the main thing was to collect the rainwater to a suitable spot and confine their attention to that, instead of trying to grow vegetables over a large area.

SHEEP ON FARMS.—Paper read at Yorketown Branch, by Mr. J. Davey, on this subject and appearing in the April issue of *Journal of Agriculture*, was discussed. The Chairman agreed that it would not do to breed from ewes after the first cross. Where the farmer intended to go in for dealing in sheep wethers would be most profitable, but where feed is good breeding lambs for market would pay well. Mr. Searle thought wethers would pay best where only a few could be kept. Mr. Wright agreed. It was the general opinion that anyone keeping sheep on a farm in this district would need to be very careful as to the number kept, especially breeding sheep, as if the season turned out dry there would be more trouble with them than with dry sheep.

Mundoora, May 3.

Present—Messrs. R. Harris (chair), T. Watt, J. Blake, D. Owens, J. J. Vanstone, W. J. Shearer, W. Mitchell, A. E. Gardiner (Hon. Sec.), and one visitor.

BONEMEAL FOR STOCK.—Members considered General Secretary's reply to inquiry re cattle chewing bones to be satisfactory. Mr. Watt said one of his cows showed signs of weakness, but had greatly improved since he had given her a little bonemeal in her feed. Members thought a little attention in this direction would be time well spent. Mr. Vanstone reported that when living on the Peninsula they lost a fine young heifer, which found, when turning over the rubbish, a piece of red lead weighing over a pound, and which she ate.

Mr. Owens had a friend lose a cow from somewhat similar cause. An iron tank had been painted with red paint, and, unknown to the owner, the heifer came round and licked the paint off before it had time to dry, and died soon afterwards. Members thought this a matter of some importance, as it showed the necessity for keeping anything likely to be injurious out of the way of the cows. Mr. Blake reported having fed copra cake steeped in warm water, mixed with crushed corn and chaff, but up to present could see no advantage from its use. The Chairman obtained good results by mixing bran with crushed corn and chaff. He finds the best way to feed it to the cows is in nosebags, as they feed more contentedly, do not waste the feed, or attempt to drive away each other, as is often the case when feeding in boxes, and the fowls do not get into the feed and annoy the cows.

BUNT.—Some discussion on this subject took place, it being suggested by some members that deterioration of the wheat, moulded grain, or injury to the grain might have a tendency to cause bunt. The Chairman said some land appeared to be more liable to bunt than others. Several years ago he and a neighbor purchased from the same person some pure clean seed wheat. His was sown on fallow without pickling and the crop was clean, while his neighbor's, sown on new land without pickling, was badly affected. He thought it must be due partly to the land. [This proves nothing. All farmers know that wheat sown without pickling in dry ground will often be clean, and the crop from the same lot of seed sown after rain will be "bunted." This is due to the fact that bunt spore will germinate with very little moisture, and if the ground is not damp enough to cause the wheat to germinate the bunt must die, whereas if the wheat starts at the same time the bunt plant will enter the growing wheat, and in due time produce bunt balls in the ears instead of wheat grains. Very little difference in the moisture in the two instances given by the Chairman would account for the difference in the crops.—GEN. SEC.] The Hon. Secretary had no doubt that the only way that bunt could be produced in the crop was from bunt spores that had not been destroyed by pickling. After further discussion it was decided to ask the General Secretary to explain the matter for the benefit of members. The methods of pickling wheat given in the April *Journal*, pages 715 and 753, were not considered to be any improvement on the systems adopted in this district, which are principally by steeping the wheat.

Onetree Hill, May 3.

Present—Messrs. F. Barritt (chair), H. H. Blackham, G. Bowman, F. Bowman, J. Flower, F. L. Ifould, W. Kelly, E. A. Kelly, A. Thomas, and J. Clucas (Hon. Sec.).

CHAFF-FEEDER FOR SHEEP.—Mr. Blackham placed on the table a model, neatly made of tin by Mr. T. Stevens, of Onetree Hill, of a chaff-feeder for sheep. The receiver was fixed in a trough, the whole movable on wheels. Mr. Raikes, of Enfield, had used this feeder successfully. The finer the chaff the better, and oats at 1s. 8d. a bushel might be mixed advantageously, and thus a smaller quantity would suffice.

TRAVELLER'S RECORDS.—Members were indebted for a most enjoyable and instructive address by Mr. Barritt, who had just returned from an extended trip through Victoria, New South Wales, and Tasmania.

He had not taken special notes for the benefit of the Branch, but his memory proved reliable, as was evidenced by a description of places of note, pleasure resorts, and the incidents of travel, illustrated by large photographs. This was an innovation which might be occasionally used to advantage by Branches of the Bureau, as having in itself the charm of novelty, which would promote improved attendance; but when the nature and capabilities of the country

journeyed through is critically scanned, and tree, shrub, cereal, and flower made to tell their own tale of utility and ornament, instruction is presented in its most attractive guise. Mr. Barritt was very much struck with the business activity of Sydney as compared with Melbourne; indeed, the resources of New South Wales he regarded as almost limitless. As an instance of how local enterprise is directed in attracting money and providing employment for workers he pointed out that the shire councils in New South Wales laid themselves out to make their pleasure resorts attractive to tourists, picnic parties, and others by making art assist Nature where desirable, constructing the best possible approach roads and providing *à la fresco* cooking appointments, &c. The immense amount of shipping at Hobart, too, and its activity as a port bespoke a prosperous and thriving community. Mr. Barritt spoke at length of the various Tasmanian industries—timber, fish, hops, &c. Salmon ponds had been constructed, and fish-breeding generally had become an established industry, even English fish being in evidence. The hop industry, with the process of treatment—picking, drying on kiln with revolving floor and turning-rake, bale-pressing, &c.—were lucidly described. The centre of the timber industry was another Saltaire, where prohibition as regards intoxicants was strictly enforced. But what engaged Mr. Barritt's attention more particularly was the apple industry, in which he has relatives in Tasmania largely concerned. A noticeable feature of the orchards was that the trees were kept so low that the fruit could be gathered without the use of ladders. As elsewhere they had to fight the ubiquitous codlin moth; but, being easily accessible, it paid them to remove the damaged fruit at the earliest stages of attack, and those engaged in this work soon became expert in detecting the presence of the pest. The utmost care was taken to destroy the infected fruit, to prevent contamination, by feeding out to pigs or boiling and using as cattle food. None but sound fruit was exported, and so it was that Tasmanian apples brought the best prices in the market. If South Australian exporters observed the same caution they would have an advantage over their Tasmanian rivals by being in a position to place their fruit upon an earlier and better market. He did not take a note of the varieties which had proved most successful, but none were more so than the Cleopatra. In order to catch certain favorable markets their first shipments were of apples which had not quite attained the mature stage, but which found ready sale. The apples were singly carefully wrapped in paper, and in packing the twisted part of the folding paper was turned under. These paper wrappers, ready cut, were imported in bales. The wrapping and packing were done by boys who contracted to do the work at 1d. per case, and so expert did they become that a single lad could manipulate 100 cases in a day of eight hours. The firm Mr. Barritt visited exported 2,000 cases last season, realising an average of 15s. per case. Six shillings per case covered everything in the way of expense, so that a comfortable margin of profit remained. The carcasses of sharks were largely used as manure, as well as superphosphates, bonedust, &c. The usual soil was like much of our own—sandy loam and clay subsoil, and the rainfall in the apple district visited was little, if anything, greater than our own, though on the West Coast it is vastly heavier. Strawberries and raspberries last season were a glut in the market.

Mr. Barritt received a hearty vote of thanks.

Mount Gambier, May 11.

Present—Messrs. M. C. Wilson (chair), A. J. Wedd, D. Norman, sen., J. Dyke, W. Mitchell, T. L. Browne, T. H. Williams, J. Kennedy, D. Norman, jun., J. C. Ruwoldt, T. Edwards, and E. Lewis (Hon. Sec.).

STOCK TRAINS.—Considerable discussion took place on resolution of Lucindale Branch in respect to running of special stock trains to Adelaide. Members did not approve of train on day suggested, and decided to support the application of stockowners and dealers for a train on Monday mornings.

SHEEP ON FARMS.—Referring to circular from Central Bureau, Mr. Wedd thought that the advantage of keeping sheep was generally acknowledged by farmers in this district, most of whom kept some. Mr. Dyke said sheep were all right so long as milk cows were not kept; they did not want them together. Members thought both sheep and cattle could be profitably kept on the same farm provided they were not running in the same paddock. They generally supported Mr. Wedd's remarks.

MANURES AND GRASS.—Mr. Wedd was trying experiments this year with different quantities of manures per acre, and would report later. Mr. Mitchell intended to try bonedust on grass to see whether it would pay. The Chairman

said the result on light land would be very good. Mr. Ruwoldt could speak from experience on this matter. The application of bonedust resulted in a prolific growth of grass. The herbage was of good color, and was preferred by stock to the unmanured grass. It increased the carrying capacity of the land considerably. In the paddock there were Yorkshire fog, rye grass, and native clover; the result of last year's manuring was still plainly noticeable. Mr. Browne said he had had some experience with manures in the North. The first year he applied 150lbs. super. per acre, with the result that the crop was all straw; after that they used 70lbs. per acre, with satisfactory results. Super. was, he thought, best where the rainfall was light and bonedust in this district. After the crop the herbage would be good. Mr. Dyke had tried super. and bonedust, but they were failures with him. Mr. Edwards intended manuring some grass land with super., and would report results.

Penola, May 11.

Present—Messrs. E. A. Stoney (chair), H. Ricketts, J. D. Wilson, W. P. Davis, D. McKay, W. Miller, S. B. Worthington, E. McBain, Dr. F. Ockley, and R. Fowler (Hon. Sec.).

MANURES.—Mr. Ricketts agreed to undertake experiments in applying different quantities of manure to wheat crops, as suggested in circular from Central Bureau. Mr. Ricketts wished to know whether muriate of potash and superphosphate could be mixed without injury to each other, and also whether super. and bonedust could be safely mixed. Mr. McBain explained the different results satisfactorily.

STOCK TRAINS.—Letter from Lucindale Branch *re* alteration in running of stock trains was considered, but suggested alteration did not meet with approval.

Mount Pleasant, May 10.

Present—Messrs. G. Phillis (chair), H. Drogemuller, P. Miller, jun., J. F. Miller, and H. A. Giles (Hon. Sec.).

VALUE OF PEAS AND SAVING MANURE.—Mr. H. A. Giles read the following paper on this subject, which was well discussed:—

I strongly recommend farmers to grow peas. As a food for pigs, unground, I find them of great value. My experience extends over many years, and I keep from fifty to 200 pigs always. In moderate quantities ground peas is an excellent food for horses or cattle; soaked, or unsoked, good for all poultry. The straw and chaff is a good fodder for colts, spare horses, and store stock, who consume it freely. It is beyond dispute proved that land after being cropped with peas will produce wheat or hay crop equal to land manured with farmyard or artificial manure. To obtain a good crop land should be heavily manured, and not less than 2bush. of seed sown or drilled per acre. Under good conditions I prefer a seeding of 3bush. The cost of harvesting and too thin sowing on insufficiently manured land are, I believe, the reasons why so few peas are grown. The first cause is now reduced to paying limit by the use of the pea collector, much used in the Gumeracha district—a comparatively cheap and durable implement. The second cause can be remedied by any careful farmer if he will save every bit of manure and treat it with common sense, viz., make a reservoir, with a scoop, as he would for saving water, and at least one day per week put in all the manure available from stables, cowsheds, pigstyes, sheepyards, and shearing-shed, closet-pans, fowlhouses, dead animals—even rabbits—and keep such manure turned and covered with a layer of earth, and, better still, watered occasionally, so that when required for the land it is thoroughly rotted, as well as the seeds therein contained. A vast amount is now annually expended in artificial manures, while a greater value is, I estimate, annually being wasted, this waste taking place on ninety-nine farms out of every hundred. I have a wide experience, but do not know the farm on which all is done that may be done to save every possible bit of manure in a common-sense way, so as to ensure its greatest value being obtained. One thing is easy to obtain, and that is the

farmer's expression "It don't pay." There is little hope for improvement until this mistaken notion is exploded by increasing intelligence, and application of a determined effort to try for one year one day per week the saving in the best manner of every bit of manure possible to be scraped up on a farm either small or big. If vendors and manufacturers of artificial manures were as inattentive as farmers to the saving and proper storage of their goods it is easy to realise they would make a loss instead of a profit, and if farmers will carefully weigh my poorly-expressed thoughts, and put them into practice faithfully to the fullest and widest extent, I venture to believe they will never regret it. Let us look at figures. One man one day per week = fifty-two days at 5s. per day, £13—just about the cost of 2 tons of super-phosphate bought at Port Adelaide and carted to this township. What is the value of fifty-two days' gathering on any farm when taken out of the pit? My pit for past year's gathering is just being emptied of over 200 loads of good manure. What is its value? Certainly the careful consideration of each of us present.

Brinkworth, May 2.

Present—Messrs. S. Auger (chair.), J. F. Everett, H. C. Welke, W. Wundke, C. Ottens, W. Welke, and J. Stott (Hon. Sec.).

ANALYSES OF FERTILISERS.—It was resolved that, in the opinion of members, the Inspector of Fertilisers should publish the analyses of samples of fertilisers taken by himself earlier in the season. It was decided to ask the General Secretary why this has not been done as soon as possible after the various shipments arrive. [The delay has been caused mainly by press of work and consequent difficulty in having the analyses completed earlier. Efforts will be made next season to publish the analyses each month.—GEN. SEC.]

SHARP AND BLUNT TOOLS.—The Hon. Secretary read a paper on "The Loss of Time Incidental to the Use of Blunt Tools," to the following effect:—

The subject is so wide that one scarcely knows where to begin, but I propose to start with keen-edged tools.

The Axe.—The majority of us are not troubled with a very sharp axe; yet a lot depends on a sharp axe—the rivalry, for instance, as to who shall chop most wood for mother for the morning. I can safely say a lot hinges on the sharpness of the axe, even with our men. Then there is the hay knife, the chaffcutter knives, and even the table knives, all blunt or with short edges. I would say, without any hesitation, that a good grindstone is a very rare article on the farm. This should not be. In the neighborhood there are many so-called grindstones, 8in. to 16in. in diameter, and nearly as round as the owner's head. Is it any use trying to save time by using such a stone? Does the sight of it not usually "blunt" the desire to sharpen the axe? The farmer who neglects to obtain a real good grindstone goes without a most useful tool. A grindstone that once started will keep going for a few rounds is wanted, and not the little apologies so common, and which nearly jerk the arms out of the man or boy turning them. A grindstone 2ft. 6in. to 3ft. in diameter will last a lifetime on a farm, and save more than most farmers imagine, provided it is conveniently set up for use. Then we have coarse-edged tools such as coulters. These are nearly out of fashion on ploughs. By doing away with the coulter you increase the draught of the plough and wear out the breast of the mouldboard all the sooner; besides, the land is not turned over so well. Even in wet or dry land, use the coulter to cut the furrow ahead of the mouldboard. You will do better work, ease the draught, and save horse feed. Even with blunt tools remember the "sharp tool" is the best.

Considerable discussion ensued. While members did not agree with Mr. Scott that the use of the coulter eased the draught, they admitted it did better work.

Lipson, May 4.

Present—Messrs. Geo. Provis (chair), S. F. Potter, H. Brougham, Chas. Provis, Jas. McCallum, A. B. Wishart, J. Wishart, J. Brown, E. J. Barraud (Hon. Sec.) and three visitors.

SUPERPHOSPHATE AND DRY WEATHER.—The Chairman wished to know if wheat and super. drilled in together, and lying in the ground for a long time

owing to dry weather before the grain germinates, would the wheat be injured by the super.? Members thought that so long as the ground was quite dry no injury would result, but if sufficient rain only fell to partially wet the soil there would be a greater risk of malting; the experience of farmers in this district tending to prove this.

WORKING THE LAND.—Mr. S. F. Potter read a paper on "The Best Method of Working Land in this District," as follows:—

As the majority of farmers in this district are using the drill and fertilisers the present is an opportune time to speak about the preparation of the soil, for we must not expect that fertilisers thrown in a badly-tilled soil can have the same chance of nourishing the crop as when it is sown in a well-prepared seed bed. As this is a comparatively dry district, with an average of 12in. to 13in. of rain, with perhaps only 8in. or 9in. falling during the growing season, the first thing we want to study is the best methods of retaining the moisture in the soil. It is an established fact that early fallowing, and well working the fallow before the dry weather sets in, will retain moisture that is equal to 2in. or even 3in. of rain to the coming crop; so I would advise early fallowing for this district. Fallow the whole of your land to be cropped, if possible: if not, try one-half or even one-fourth, working it down before the end of September; then it will require very little work to make a good seed bed. As a general rule the best time to sow is from the middle of April to the end of May. With regard to quantity of seed to sow, much depends on the variety of wheat and the class of land it is being sown on. If it is a variety that stools well, such as Red or Purple Straw, a lesser quantity will be required than if it is a variety that does not stool thickly, as most of the early wheats. Sow about 30lbs. of the former and 35lbs. or 40lbs. of the latter, that is if the land is of a light or free sandy nature; if heavy clay land, sow 10lbs. more seed to the acre. As superphosphate is about the only fertiliser used in this district I will only deal with it. My experience so far has been that it is not profitable to use more than 50lbs. or 70lbs. to the acre—the rainfall does not seem sufficient to warrant the use of a larger quantity; but I think that, with judicious working of the fallow, especially in the hilly country, 1cwt. may be used to advantage. It is a very unwise plan to continually burn the stubbles and crop the same piece of land for a number of years. By burning the stubbles you are destroying a lot of valuable plant food, with the result that in a few years the land will be robbed of all the humus and organic matters that are so necessary to plant life. Leave the stubbles for the use of the stock and to be trampled into the soil by them, to rot and become a manure for the land. As land is plentiful in this district I should say crop once in three years. Divide your arable land into three, having one-third under crop, one-third fallow, and the other third can be used for grazing until it is required for fallowing to complete the round. Under this principle 200 acres will be equal to 300 acres under the old method, for not only will the land keep in good condition, but it will improve, and better crops will be grown than at present.

The Hon. Secretary thought it might be advisable to plough the stubble under in districts with a good rainfall, but here he preferred to burn it, as there was not sufficient moisture in the ground to cause it to rot. The unrotted stubble in the soil was apt to keep it too open. He would sooner plough in a green crop. Mr. C Provis wished to know whether sulphuric acid applied to sheep manure would make the plant food in it more available to the plants. The Hon. Secretary and Mr. Potter did not think so. [The phosphates in sheep manure constitute a very small percentage of the bulk, and it would certainly not be advisable to treat it with sulphuric acid, apart from any question of the nitrogen that would probably be lost by treating it with acid.—GEN. SEC.]

Scales Bay, May 11.

Present—Messrs. A. Newbold (chair), Geo. Newbold, J. E. Dinsdale, W. E. Thomas, J. J. Roberts, E. R. Atchison, and D. P. Thomas (Hon. Sec.).

OFFICERS.—Messrs. A. Newbold and D. P. Thomas were re-elected Chairman and Hon. Secretary, respectively, for ensuing year.

PICKLING SEED-WHEAT.—Mr. A. Newbold read a paper on this subject:—

In dealing with the subject, I must first of all tell you there are two kinds of "smut." One consists of hard brown shells. This kind can occasionally be found with good wheat on one side of the head and bunted on the other side, probably caused by rain falling when the wheat is in bloom. The other kind is soft and black, and adheres to the fingers when squeezed,

emitting a strong smell. Pickle is said to prevent the latter kind. One season I sowed a piece of land with wheat badly bunted; a portion of this land was scrub, the other part was black grass. What I sowed on the scrub was free from bunt. That on the black grass country was badly affected by it. As the wheat had all been sown and covered at the same time, and coming up with the same rain, I determined to try and find out why one part was bunted and the other free from it. The following year I pickled six bags of wheat with arsenic, using 1oz. to the bag. Six bags I pickled with bluestone; one bag I pickled with lime. They were all sown at the same time. Of that I pickled with arsenic not one-fourth grew. What came up was perfectly free from bunt. Of that I pickled with bluestone about one-half came up. This also was free from bunt. That which I did with lime must have all grown, as it was as thick again as either of the others, free from bunt, and yielding more than the others, and a far better sample. The following year I pickled some bunted wheat with bluestone, using 1lb. to the bag, and sowing it straight off. The result was I had about half bunt when I came to reap the wheat. Last season I pickled my wheat with fresh burnt lime and sea water, using one shovel-full of the former and one bucket-full of the latter to the bag. Some of it I left stand for a day to dry; some I sowed straight off, using several kinds of wheat—the most notable was Steinwedel. This I sowed on the wettest of land. I examined it carefully at harvest, and I could not find one bunted ear in the whole crop that had been treated with this pickle. The conclusion I arrived at is that anything which acts as a dryer on wheat will prevent bunt. The ashes on the scrub lands prevents wheat from bunting. Strong pickles, such as arsenic and bluestone, injure the wheat, impair its vitality, and when taken to the market they do not reach the standard. Lime in this district is to be had for the burning. Anyone using it as I have done will find their yield increased and sample improved. The lime must be fresh burnt, or failure may probably follow. The following is a simple and easy method of using the pickle:—Turn out 50 to 100 bags on a hard floor, throw the water over it, turn with a shovel, adding the lime while turning; turn over a couple of times, let it stand till dry, then run through the winnower. This will take out the loose lime and drake that may be in the seed, as it gets shrivel'd with the lime and easily goes through the screen.

Mr. Dinsdale had never known bunt to occur on scrub land, although crops on land that was patchy with broken scrub had been affected. Mr. Roberts had not pickled the seed they used on their scrub lands, and yet the crops were always free, even when badly affected seed was used. The Hon. Secretary had noticed that deep clay and black grass lands were most liable to bunt. The condition of the soil at time of sowing appeared to him to be to a certain extent responsible for freedom or otherwise of the crop from bunt. In one instance he knew of all but the headlands in a paddock had been sown and harrowed, when heavy rains stopped work. As soon as possible afterwards the headlands were sown, all the wheat being unpickled. At harvest fully one-third of the crop on the headlands was bunt, the rest of the paddock being quite free.

WHEAT EXPERIMENTS.—Mr. Newbold reported that he could not recommend Ranjit wheat for this district. Mr. Dinsdale tried Silver King, but it failed during the dry spring. Mr. W. E. Thomas grew Majestic and would give it a further trial.

Watervale, April 29.

Present—Messrs. C. A. Sobels (chair), H. Beck, H. Ashton, H. Scovell, G. Hunter, G. Holder, W. Smith, and E. Treloar (Hon. Sec.).

CURCULIO BEETLE.—Mr. Smith reported that he had found the remedies recommended by the Central Bureau quite useless in checking this pest. [And yet spraying the plants attacked with Paris green and lime—using the Paris green, bran, and sugar mixture, and bandages for trapping where the plants attacked permit of this being done—have all been proved of value elsewhere.—GEN. SEC.].

VINEYARDS.—The inspector of the Phylloxera Board has recently visited the vineyards in this district and found them quite free from disease. He expressed a high opinion of the capabilities of the district.

EXHIBITS.—Mr. G. Hunter tabled several samples of *Esopus Spitzenberg* apple, which were considered to be of superior quality.

Boothby, May 7.

Present—Messrs. H. S. Robinson (chair), G. T. Way, J. Bell, R. Chaplin, and A. Rob (Hon. Sec.).

PICKLING WHEAT.—Mr. R. Chaplin asked if wheat were pickled and dried, and then sown and left a few days before harrowing, would it become bunted if rain came and it were harrowed in whilst wet? [No; because the spores of bunt have been killed by the pickle. — GEN. SEC.]

FEEDING HORSES.—Mr. J. Bell read the following paper:—

How to feed working horses to the best advantage, and get them to perform the largest amount of work at the least possible cost, is a most important consideration. In the first place the work as well as the feeding must be regulated. Still it is very hard to say what is a fair day's work: it depends on the class of horse and also the work. Work which entails much stopping and starting is naturally exhausting. The horse must have suitable work, as well as suitable feed. It is also necessary to watch the condition of the horses, as if they are losing condition, something is not right. Either they are overworked or underfed, or have not a good attendant. It is only false economy to overwork horses, as they gradually fall off in condition and lose strength, and, in the long run, their constitution is injured. Regularity in feeding is absolutely necessary. The horse possesses a very small stomach, and should have at least three, and, if possible, four feeds a day. They should not be given enough to allow of waste, or fed extravagantly one time and sparingly the next. A quantity of feed should never be left for the horse to blow and breathe over, and so become sour; some horses are very dainty feeders, and even though very hungry, will refuse such feed. You cannot draw out any rigid rules as to quantity, but must learn by taking notice of each horse, so as to know his requirements. By far the best grain that can be used is oats, and if you are restricted to one grain it should undoubtedly be oats, as they contain in the best form all that is necessary to life. Crushed wheat is also a good feed, but should be used with bran, as it is too heating alone. Boiled wheat is also used extensively, but it is necessary to mix it well with chaff, or horses coming in tired and hungry are apt to bolt it and cause digestive troubles. Whole raw wheat is also favored by some, but I do not consider it a good feed alone, as I am of opinion that if horses are fed with a quantity sufficient to keep up their condition while working hard for any lengthy period disastrous results will inevitably follow. Care should be taken that all chaff and hay are as free as possible from mould or dust. Where feed is damped it helps to lay the dust, and it also draws forth the natural aroma of the chaff, helping to entice the horse's appetite, and also enables him to masticate his food better. Treacle or molasses dissolved in water is a very useful addition to rations, the feed being damped with it. A large quantity of horse ailments are caused through injudicious feeding, or want of knowledge in feeding. But, however carefully fed, they must also be well cleaned and protected from cold to get the most economical results. The feed consumed to produce warmth is in reality wasted, as, if protected against cold, the food could have gone to supply the waste in muscle, &c. The main object is to form muscular frame without adding an undue amount of fat. What feeding stuffs a man uses must be determined by circumstances, such as price locally of different grains, what can be produced on the farm, also a man's own pocket. I have not mentioned anything about watering, as Mr. W. Forbes will read a paper on this subject this evening. There are other questions also, such as, "Which is the better, oatmeal or wheaten hay?" It would also be well, now that the use of fertilisers is becoming general, for members to experiment as to value of hay grown with and without fertilisers. Horses should be got into good condition before going into heavy work, as it is very difficult to improve their condition while working hard, if once allowed to get low. Rough-haired horses can with advantage be clipped, so long as they are protected from cold at night. Clipped horses sweat less, and so naturally have not so much waste to repair. It is also a good plan to place a free worker, or one requiring extra feed, by himself.

Mr. H. S. Robinson did not agree with damping the feed, and said if horses are fed largely upon wheat they get sore shoulders, and losses might occur through the too liberal use of wheat. Mr. Way said it would be advantageous to do away with "cocky chaff," and substitute wheaten or oatmeal hay. He divided a 70lb. bag of chaff between the nosebags of eleven horses at mid-day. Mr. Chaplin said maize is a very heating and binding food.

CO-OPERATION.—Mr. H. S. Robinson thought it would be advisable to co-operate to collect produce, as individuals had to sell their small lots at a great loss. The storekeepers would not handle produce for less than 10 per cent. profit. The locality was very suitable for poultry. He had not known any one who had started dealing in produce and selling groceries, &c., who had

not done well. Mr. Way had an idea that such a business would be risky. Mr. Chaplin said at present the storekeepers gave little encouragement to farmers' wives in regard to butter and eggs, and there was a good prospect for a collector and dealer in groceries and dairy produce. Members resolved if possible to procure some Bronzewing turkeys and Yorkshire boar pigs for breeding purposes.

WATERING HORSES.—Mr. A. Rob read the following extract *re* watering horses :—

Capt Hayes, who has had experience on all the four continents and is probably the greatest authority on this subject, says :—“ If the horse be allowed to cool down without getting water, his blood will gradually recover its fluidity at the expense of his tissues. It is reasonable to suppose that useless waste of tissues—of which water forms a component part is weakening ; and consequently exhaustion is entailed by stinting the horse of water when he is heated by exercise. Experience proves, both in our own persons and in that of our horses, that drinking a moderate amount of water when the man or other animal is hot and tired from hard work diminishes to a very great extent—or altogether obviates—any subsequent exhaustion or depression. Again, experience proves that it is perfectly safe to water horses immediately after work, no matter how hot they may be, provided that the water is not cold.”

Members agreed, and were unanimously in favor of water before feed.

MALLEE SHOOTS.—Mr. Way was informed that February is about the best time to cut mallee shoots, and then sheep should be pastured on the cleared land.

CURL-LEAF ON PEACH TREES.—The cure for peach-leaf curl is to spray the trees with winter strength Bordeaux mixture when the buds begin to swell and before they open.

Crystal Brook, May 4.

Present—Messrs. J. C. Symons (chair), M. Weston, W. Natt, W. J. Venning, P. Pavy, G. Davidson, W. Hamlyn, W. Morrish, J. Bryson, and F. S. Keen (Hon. Sec.).

SHEEP ON FARMS.—Considerable discussion on this subject took place, all being agreed that sheep are a necessity on well-conducted farms.

MANURES.—Discussion on quantity of manure per acre to apply ensued. Several members expressed their intention to carry out experiments on the lines suggested in circular from Central Bureau.

FIELD TRIAL.—It was decided to endeavor to arrange for a field trial of complete harvesters at Crystal Brook.

Kanmantoo, May 4.

Present—Messrs. Thos. Hair (chair), W. G. Mills, J. Downing, P. Lewis, T. Hawthorne, A. D. Hair, and F. Lehmann (Hon. Sec.).

HOW TO MAKE FARM LIFE ATTRACTIVE.—The Chairman read a paper on this subject. The following are the principal items :—

This is a subject well worthy of constant study by every person concerned. If the farmer owns a moderate capital, with lots of energy, perseverance, and is a good manager, the task is comparatively easy. Although farming is not conducive to the rapid accumulation of colossal wealth, still it is a most interesting, healthy, and attractive occupation, if properly conducted. It is largely free from the temptations and allurements of city life, and is conducive to good morals and happy contentment. There is much interest to be aroused in watching the growth of plants and animals ; and farmers could greatly add to the value and beauty of their holdings if they would plant large numbers of trees. He had about seven acres planted with sugar gums in 1890, and they are now from 30ft to 40ft. high. One can derive much pleasure from the ownership of superior stock, or a clean well-ordered farm, or a good garden or orchard. Then nearly every farmer has a family, and their lives can be lightened, improved, and made

pleasant by encouraging sociability with neighbors and friends. Instrumental and vocal music, literature, and a hundred other harmless amusements should be fostered for leisure hours, and thus the toil and necessary labor on the farm would be lightened and made agreeable and attractive.

Mr. J. Downing said a garden was always attractive and interesting to visitors as well as the owner. It was better to own good books than to get them from the library. The Chairman said every paddock should have a clump of trees. Mr. Mills advocated planting trees liberally on hill tops to attract rain as well as to shelter stock and crops.

HAY.—Mr. J. Downing had grown Algerian oats for hay during the past two seasons, and prefers it to wheaten hay for his horses, which are very fond of it. Members say Steinwedel hay is too light and loses too much of its grain.

Narridy, May 18.

Present—Messrs. J. Darley (chair), R. Satchell, D. Creedon, J. Liddle, J. Nicholson, F. Easter, and T. Dunsford (Hon. Sec.).

NORTHERN CONFERENCES.—It was resolved that, in the opinion of this Branch, the annual Conference of Northern Branches should be held at Crystal Brook in 1902.

MANURE EXPERIMENT.—Mr. Satchell reported having applied manure in different quantities per acre, as suggested in circular from Central Bureau.

Cherry Gardens, May 14.

Present—Messrs. C. Lewis (chair), T. Jacobs, J. Lewis, J. Potter, W. B. Burpee, H. Strange, G. Brumby, A. Broadbent, J. Potter, J. Richards, J. Metcalf, and C. Ricks (Hon. Sec.).

CODLIN MOTH.—A long discussion on this subject took place, there being considerable difference of opinion upon the advisableness of prohibiting the sale of infested fruit. Attention was directed to report that in New Zealand a fly was attacking and destroying the egg of the codlin moth, and that this only occurs on unsprayed trees. It was also said that the fruit trees must be left unsprayed, as the insecticides kill the fly and the codlin moth increases. [This statement bears evidence of the authorship of some irresponsible person. It is a difficulty to understand how a poison sprayed on the fruit and leaves, and only injurious when actually eaten by insects, can in any way destroy a fly that eats the eggs of the codlin moth. Inquiries have been made as to whether there is any truth in the statement that there has been any marked decrease in the codlin moth in the locality mentioned in the report.—GEN. SEC.]

BRANCH SHOW.—The balance-sheet in connection with the local show disclosed a surplus of over £4.

Wilson, May 4.

Present—Messrs. D. McNeil (chair), W. H. Neal, R. Rowe, T. Barnes, J. H. Gill, T. Matthews, H. T. Crossman, A. Canning (Hon. Sec.), and one visitor.

DOG PEST.—Wild dogs were reported to be increasing and becoming more troublesome to sheepowners.

IMPROVEMENT OF HORSES.—A discussion on this subject took place. Owing to the chronic shortness of feed in this district horse-breeding was a difficult undertaking, as to increase the number of stock often means starving the lot.

It was generally agreed that in such seasons as experienced of late it would be extremely unwise to breed many horses, as the risk of loss was too great.

CONSERVATION OF WATER.—This subject was discussed, but it was generally held that any scheme, to be of real service in times of drought, would be too costly to permit of the residents paying interest. Doubt was also expressed whether, owing to the uncertainty of the season, any money could be raised for the purpose even if considered desirable.

Yorke town, May 11.

Present—Messrs. J. Koth (chair.), C. Domaschenz, C. H. Davey, T. Corlett, J. Latty, G. Bull, and J. Davey (Hon. Sec.).

FEEDING SHEEP.—A short discussion took place on paper by Mr. J. Flower, of Onetree Hill. It was thought that feeding with chaffed hay might pay those farmers near Adelaide, with meat at present prices. The Hon. Secretary kept his sheep in fairly good condition several years ago during a very dry autumn and winter by scattering a small quantity of hay daily in the paddocks.

PLANT FOOD REMOVED BY CROPS.—Mr. Bull wished to know what quantity of phosphate would be removed from the land by a 20bush. wheat crop. [A 20bush. crop of wheat would take from the soil, in grain, 13½lbs. phosphoric acid, 13½lbs. potash, and 32lbs. nitrogen. To supply the 13½lbs. phosphoric acid would require about 80lbs. superphosphate.—GEN. SEC.]

Naracoorte, May 11.

Present—Messrs. S. Schinckel (chair), E. C. Bates, W. Hastings, E. R. Peake, A. Caldwell, H. Hassler, H. Smith, F. Welcome, E. Thomas, and A. Johnstone (Hon. Sec.).

BULL.—After a long discussion it was resolved that the Branch shall make an offer for purchase of the bull Royal Progress, now on loan to the members.

STOCK TRAIN.—Decided to support application by Lucindale Branch for a special stock train to run on Tuesdays in place of Mondays as at present.

TUBERCULIN AND TUBERCULOSIS.—Considerable discussion took place upon the possibility that the application of the tuberculin test could result in the future development of tuberculosis in the animal so treated. Reference was made to Dr. Ockley's opinion that the test would be of great value if it acts as a preventive of tubercular disease, and to his doubt whether or not the test is liable to impart the disease. Portion of a report by Mr. J. A. Gilruth, M.R.C.V.S., Chief Veterinary Officer and Bacteriologist, of New Zealand, was read, as follows:—

The idea that the injection of tuberculin into healthy animals may set up tuberculosis in their systems, mentioned by Mr. Reshes as being current in Otago is, as he states, both incorrect and absurd; so much so, in fact, that it could hardly be considered worthy of notice were it not that this erroneous supposition appears to have hampered in some respects the work in some districts. It has been proved again and again to be absolutely impossible for tuberculin to give tuberculosis or do any harm whatever to a healthy animal.

Later on the Hon. Secretary read the following remarks sent by Mr. J. G. Forster:—

Referring to the recent Conference at Penola, and the paper on tuberculin test, I should certainly object to use the test until it has been thoroughly demonstrated that it does not infect a non-diseased animal, as we have the case of Morambro, known to be healthy for fifty years. Early in 1900 the manager had his dairy herd tested, and reported in the *Naracoorte Herald* as being free from tuberculosis, and remarked on as being very satisfactory to the owners. About the beginning of this year tuberculosis was found to exist on the station, cattle were killed and yards burnt, but no appearance in the *Herald* this time. The query is

—Did the tuberculin test cause the disease later? I doubt if, after a tuberculin test tuberculosis follows, those outside the "know" would hear anything about it. And I agree with Dr. Ockley, if it were a preventive it would be of great value. I think the remarks of Mr. A. Molineux, that Dr. Ockley would like to see the disease propagated, is uncalled for, and would cause many to refrain from expressing their opinions if they are to be subjected to such insinuating remarks by one of the leaders of the Bureau. Doctors might benefit by the increase of the tuberculosis, but none of their profession wish to increase the disease. It seems to me that the aim is to cause the compulsory tuberculin test by Act of Parliament, thus creating more officials and a repetition of the Coorong slaughter of fat sheep.

[The General Secretary jocularly remarked that if everybody were not aware that *all* doctors are humane, and deeply solicitous to efface tuberculous diseases, Dr. Ockley's statement, that he had drunk gallons of milk from tuberculous cows, might lead us to think that he would regard an outbreak of tuberculous disease as being good for his profession. The General Secretary feels sure that neither the respected doctor, nor anyone else, felt that any insult was intended or conveyed in the remarks.—GEN. SEC.]

WATTLE-GROWING.—Mr. E. R. Peake said that on a recent visit to Mount Barker he had been struck with the extent of the wattle-growing industry in that district, and he had gathered some information about it which might be useful. Large quantities of land that had been used for wheat-growing had been put down with wattle, and they had been found more profitable than wheat. The seed was sown broadcast with a crop of wheat or some other cereal, and after the crop was taken off the wattles came up. The third year a profit was reaped from stripping the bark; and the timber was a valuable produce as firewood, and at the same time cleared the ground. He noticed they grew well on light poor soils. There was a great deal of light poor soil in their district which might profitably be utilised for wattle-growing. Some years ago, Sir John Downer, when visiting England, made some terms with a syndicate there for leasing some 30,000 acres of land on the range running from Naracoorte to Padthaway for wattle-growing, but, owing to a change of Ministry the matter dropped. He was certain there was a great quantity of land suitable for the cultivation of the wattle in their district, but which was little use for pastoral purposes, and he thought steps should be taken to test it. He had seen plantations of wattle trees along the ranges in and around Naracoorte which would return good money. The range along the Penola Road was also good country for them. Members mentioned that the golden wattle grows naturally and luxuriantly in many places around Naracoorte, where sheep are not allowed to graze.

Strathalbyn, May 20.

Present—Messrs. M. Rankine (chair), B. Smith, R. Watt, G. Sissons, W. M. Rankine, P. Cockburn, G. M. Meikle, John Cheriton (Hon. Sec.), and one visitor.

RAILAGE CHARGES.—The following resolution was unanimously carried:—"That in the opinion of those present the charges per rail are very unjust to the producer, more especially to the small one, and we consider that fertilisers should be carried at a uniform price per ton, and that as low as possible. The railway would very materially benefit by the increased production, and as a large number of trucks leave Adelaide empty the cost to the department would be almost *nil*."

FERTILISERS. The general opinion was that some soils will benefit from the application of 2cwts. to 3cwts. of super. per acre, whilst so large a quantity would injure on other soils.

CATTLE DISEASE.—Mr. B. Smith had lost two heifers: one, about 2 years old, died quite suddenly, as if from poison. Members could not account for the deaths, unless through the dryness of the season.

FRUIT-GROWING.—Mr. G. M. Meikle read a paper, to the following effect :—

There are certain general principles in fruit-growing which apply to all districts, whether under irrigation or with a sufficient rainfall. While certain fruits seem to do almost anywhere, still there are conditions under which they do best, and to be really successful the best varieties of fruit must be grown under the most favorable conditions. In planting an orchard several very important points have to be decided—What sorts of fruit are most suitable for the district, and what are the best varieties of these fruits? Whether to plant for the fresh fruit market, or to dry the fruit? I would very strongly advise planting only such varieties as would dry; should there be a glut in the fresh fruit markets then the grower who has drying fruits can be independent, and if he cannot get his price for green fruit can always get good returns from dried. By careful selection, varieties of fruit can be got which can be successfully treated here. I intend to deal with drying fruits only. Of all dried fruits, undoubtedly one of the most taking in appearance is the apricot, and one for which there is an increasing demand. While admitting that the Moorpark is as a fruit unequalled, still as a drier it is not the most profitable, and after all it is not appearance and quality only we require, but returns from sales. On these points I would plant the Blenheim apricot, though as a fresh fruit it is inferior to the Moorpark. The Moorpark tree is rather a shy bearer, a good crop one year being generally followed by a light one; the fruit ripens very unevenly, sometimes extending over quite ten days; an extra hot day will ripen fruit which in the morning was hard, so that by evening a slight wind will shake it down, and the fruit being heavy and soft is very easily damaged, the fruit is very juicy, and in consequence dries light, up to 6½lbs. to 1lb. The Blenheim is a heavy and consistent cropper, one tree I had giving for four years from 329lbs. to 360lbs. of fruit; the fruit is smaller and lighter than the Moorpark and ripens very evenly, one visit to the tree stripping it; and the fruit being light permits its being shaken down into a tarpaulin; it is of a messy appearance when opened, and has not the amount of juice the Moorpark has, so dries much better—4½lbs. to 1lb. Take 10 lbs. weight of fresh fruit of each variety and work their dried values out, admitting that the Moorpark, the finer fruit, to be 1d. per pound higher; 100lbs Moorpark at 6½lbs. to 1lb. gives us 15½lbs. dried fruit at 8d. per pound, or 10s. 6d.; 100lbs. Blenheim at 4½lbs. to 1lb. gives us 22½lbs. at 7d. per pound, or 13s., a clear gain of 2s. 8d. per 100lbs. in favor of the Blenheim. Apricot trees are generally planted eighty to the acre, so at the above prices, and allowing 160lbs. per tree per annum, the Blenheim shows a return of £10 13s. 4d. over the Moorpark. My experience, however goes to prove that while the Blenheim carried quite 200lbs. per tree, on an average, the Moorpark came very far short of an average of even 100lbs. The process of drying the apricot is very simple, but entails an endless amount of labor, and unless a supply of cheap labor is available care should be taken in planting. When the fruit is picked it must be carefully pulled; a sharp knife must be used, making a clean cut all round the stone, as any tearing of the fruit apart leaves a ragged edge to the dried article which quite spoils its appearance. The halves must be carefully placed on the trays, as during the sulphuring the cups fill up with juice, which would be lost were the fruit placed unevenly, besides causing the fruit to stick to the trays. The trays must be lifted carefully into the sulphur-house, where they stand in the fumes for at least two hours. They are then spread out in the sun, and should be dried in about three to five days, according to the weather. Should there be any signs of dust, trays must be stacked at night. The fruit when dried is generally picked off the trays into two grades, and finally packed in 20lb boxes. The labor and expense attached to apricot-drying are excessive, and there is always the risk of rain while the drying is going on, or what is almost as bad, a violent duststorm, which leaves all your undried apricots on the trays a mass of grit. I once saw over 1,000 trays of apricots quite destroyed in an hour by a duststorm.

Peaches are dried exactly like apricots, but they cannot be recommended. A few of the very early varieties always sell well, and of them the trees are so unsatisfactory as a rule that I should say Briggs' Red May and Amsden's June to be quite the best I know.

I have dealt at considerable length with the apricot, mainly because, with the exception of the raisin grape, I have had more to do with the drying of it than any other fruit. I have had a little experience with prunes, and think, when the business of drying them is quite mastered, that they should be much more profitable than the apricot. The prune is an older-established fruit than the apricot, and commands a much wider market, as it can be produced so much cheaper. There is no taking the stone out, which is rather a costly item in apricot-drying, meaning on an average a loss of 10 per cent in weight. This 10 per cent. saved in the prune fetches the same price as the rest of the fruit, being of course included in weight. I found that prunes at 4d. per pound paid better than apricots at 7d. per pound, prunes drying at about 3½lbs. to 3½lbs. to 1lb. The variety I think most of is a yellow plum called, I believe, the Decaisne; the tree is a heavy and regular cropper, and a very even ripener. I tried several varieties of black plums, but could not turn out a really good prune. The process of drying is slightly different to the apricot-drying, and while the method can be given experience is required. The prunes have to be dipped in lye to crack the skin, and the proper strength of the lye can only be found by experimenting.

The ordinary raisin grape—the Gordo Blanco—is rather too late for this district, and would probably require artificial drying, an average season at Mildura running into April. The currant and sultana however, should do well, and ripen early enough in the summer to ensure drying weather being got.

One word about buying trees. Buy the best, and do not pay much attention to what the nurseryman recommends; he is simply anxious to sell. If he has not got the varieties on his lists which you want, go elsewhere; go to a reliable nursery and pay a price for trees that leaves a profit to the grower. Cheap trees, which after being tended for years turn out to be the wrong varieties and have to be reworked, are very expensive in the end.

Bute, April 30.

Present—Messrs. H. Schroeter (chair.), E. Ebsary, J. H. Barnes, W. A. Hamdorf, S. Trengove, D. McEvoy, and A. Sharman (Hon. Sec.).

FIELD TRIALS.—It was decided to support suggestion of Paskeville Branch, that a field trial of complete harvesters should be held at Paskeville, early next harvest, providing it can be held in connection with the general trial of harvesting implements, and judging be on same principle as other machinery.

FEEDING HORSES.—A long discussion on this subject took place. Mr. Ebsary had used most kinds of foods, and was of opinion that scalded wheat or oats gave most satisfaction. Messrs. Schroeter Bros. found their horses did better on oats than on any other food tried.

Pine Forest, May 7.

Present—Messrs. J. Phillis (chair), F. Masters, R. W. Bawden, J. Flowers, W. Kempster, and R. Barr, jun. (Hon. Sec.).

MANURE EXPERIMENTS.—Some members gave a few instances where heavy dressings of fertilisers forced the wheat plant too much in regard to frost. They thought the use of over $\frac{1}{2}$ cwt. to the acre too risky in this district, but will experiment in this direction by using $\frac{1}{2}$ cwt., 1 cwt., and $1\frac{1}{2}$ cwt. per acre.

DRAUGHT STALLION.—A sub-committee was appointed to make inquiries respecting a draught stallion for the Branch.

COMBINED SHOW.—Meeting of presidents of Mundoora, Port Broughton, and Pine Forest Show Society to be called to arrange for a show during next September.

Clare, May 10.

Present—Messrs. W. Kelly (chair), J. Christison, G. Lloyd, R. F. S. Martin, J. T. Hague, H. Carter, S. C. Bray, C. J. McCarthy, H. J. Yelland (Hon. Sec.), and five visitors.

SHEEP.—Members consider that sheep on the farm pay for themselves, if only for the mutton, to say nothing of the wool and the benefit derived from cleaning the land.

BLIGHTING OF WHEAT.—It is questioned whether or not heavy dressings of superphosphate have the effect of causing wheat to blight. One member said he had part of his land fertilised with 2 cwt. per acre and another part with 1 cwt. The portion heavily dressed was badly blighted (and even before blighting it did not look as good as the other), whilst that manured with 1 cwt. per acre yielded 16 bush. per acre of grain. It was suggested that the heavily-fertilised crop may have been more forward than the other at the time the frost occurred; and it is well known that wheat is liable to be injured by cold or by hot winds whilst the plant is in flower.

CODLIN MOTH.—Mr. Christison reported having received information that a number of empty fruit cases had been brought from the Balhannah district. This may have escaped the notice of the district inspector, but thought that it should not have been allowed, and should have been legally dealt with. The following resolution was passed:—"That prompt care and inspection had not been exercised in this district recently in regard to the supervision of the Codlin Moth Act, in that a number of empty fruit cases, infested with codlin moth, were brought into this district without the necessary precautions being taken. This Branch also desires that the provisions of the Act be strictly enforced, and infringements thereof legally dealt with."

PRUNING.—Mr. McCarthy read a paper to the following effect:—

This subject has been well and ably thrashed out by the growers in this district, and well illustrated and explained by Mr. Quinn in the *Journal of Agriculture*. First I will take the pruning of the apple tree from the age of five years and upwards, taking for granted that the trees are well shaped at four or five years old. It does not by any means say that all the different varieties should be pruned the same way. For example, the Jonath'an has a peculiar habit of bearing its first fruit on the extreme end of its laterals; had those laterals been pruned back in the ordinary way to two or three buds, we would have had little or no fruit on this season. I did not touch a lot of these from 3in. to 1ft. long; the result was a fairly good crop and a fine sample of fruit. The pruner, with a little trouble and care, can readily note the difference between a wood bud and a flower bud; the latter is much more full and round, more like a bulb; the former not so large, flatter and pointed. The same thing applies to other sorts. A vigorous-growing Rome Beauty has much the same habit of bearing a lot of its fruit on the last year's wood. Of course, in time, when the trees get older and more matured, these laterals can be all spurred back, and the trees will bear quite heavily enough on the short spurs. There are a large number of other varieties, such as Cleopatra, Dunn's Seedling, London Pippin, King of Pippin, Stone Pippin, Five Crown Pippin, &c., if not cut back too sharp will bear well on the short spurs on the main limbs, and the pruner is safe in spurring the laterals.

There is no hard and fast rule for pruning. The pruner should understand his work well, and use his own judgment. Very often you will find trees of the same age and of the same sort that will require entirely different treatment. When I come to a tree that has made a lot of wood the previous summer I leave it plenty of wood. If you prune it back sharply mostly all of the buds left will send out laterals, and there will be nothing but a confusion of growth the next summer or winter. It is a mistake to leave a tree of that description go altogether without a slight topping, for this reason: say the growth is 2ft. or more long, and not topped, the result will be the next year that from 9in. to 1ft. of the wood left will be quite barren at the bottom, with blind eyes or buds, and further up, and at the extreme end the fruit buds, and if you cut it back the next season on the two-year-old wood a large number of the spurs will necessarily have to be cut off. I like to see a tree with plenty of wood, and fairly thick. Before coming into bearing, and with the weight of the first crop or two, of their own accord the trees will open out quite enough to let in plenty of air, light, &c. You can soon take a limb out, but it would be impossible to put any in. Besides, some of our trees that have the die-back, you can remove a limb or two without leaving a big gap and the tree lopsided. Now, as to the pears; they require very much the same class of pruning as the apple. The Duchess should be pruned back sharp, until at least 5 or 6 years old. The wood is of a very soft nature, and if the main limbs are not built up strong the weight of the fruit bends them down, and very often twists them around, and then there is no hope of them going back to their proper place. The Winter Nellis is one of the most difficult to prune with any success. You generally find them covered with blossom, and set but very little fruit. Last winter I took a lot of pains pruning them by cutting out quite half the bearing or blossoming wood, and out of about fifty trees there was not a half dozen that did not have a good crop on. It is slow and tedious work, but if the results are as good as ours were this season, it will pay for the extra time and trouble. A number of the different kinds bear most of their first crops on the young laterals, notably, Gansell's Bergamot, D'urondeau, Louise Bonne de Jersey. You are quite safe in spurring short Josephine de Malins, Beurre Clairg'au, Backhouse, Bergamot, Winter Cole, and Madame Cole, and Kieffer's Hybrid.

I have done a lot of experimenting both on pears and apple trees, to try and force them into bearing by summer pruning, at different times of the season, and have found out nothing worth recommending. One advantage, if you summer prune the trees you can get over about twice the number in the winter. Do as you may, some kinds will have to be a certain age before bearing any fruit. We have two trees seven years old, Northern Spy stock, and were budded with Rome Beauty. Both the stock and bud were left to grow, and now the tree is a pure half-and-half—even the trunk from the bud up. The Rome Beauty has borne its third crop,

but the other half, Northern Spy, has never had a blossom on yet. When pruning a tree that is too thick I cut out the leading shoot close back to the second one (if good enough) for two reasons—firstly, it tends to keep the tree from growing too high; secondly, if you cut off the lower and leave the leading one you will have a scar on the side of the limb, and it will check the flow of sap for a time to some extent. This way may be practised to advantage in the general pruning of the tree, when you do not want to remove the limb altogether.

Stansbury, May 11.

Present—Messrs. A. Anderson (chair), P. Anderson, J. Sheriff, G. Jones, and P. Cornish (Hon. Sec.).

SHEEP.—Members are of the opinion that sheep are almost indispensable on the farm, not only for meat supply and for wool, but also as a profitable means of clearing weeds off the land. In view of the low prices for wheat and hay, and of the high prices ruling for meat, it will pay to feed sheep with a portion of hay and fatten them for market.

GALLAND'S HYBRID WHEAT.—Mr. J. Sheriff said he had purchased for trial some Galland's Hybrid wheat, a variety that has been most successfully grown for hay by Mr. R. Smith, of Golden Grove, who obtained the original seed from the Central Bureau. It is a very strong tall-growing variety.

Mount Bryan East, April 27.

Present—Messrs. Thos. Wilks (chair), Jno. Wilks, B. H. Dunstan, W. Brice, and J. Honan (Hon. Sec.).

EXHIBITS.—Mr. Brice showed some heads of Ranjit wheat sown in November, and grown under irrigation. The plants were nearly 3ft. high, but the straw remained green while the heads were nearly ripe. He also tabled nice sample of quince from a four-year-old tree.

WILD DOGS AND FOXES.—This Branch wishes to direct attention of members of South-Eastern Branches troubled by dogs or foxes to Mr. Peter Waite's method of destroying wild dogs. He shuts up the flock in a dog-proof yard, leaving out a couple of old cull ewes and lambs. The lambs are smeared with hot fat, and powdered strychnine sprinkled over them. Care must of course be taken that the lambs are not handled more than absolutely necessary.

Mount Compass, May 11.

Present—Messrs. M. Jacobs (chair), S. Arthur, F. McKinlay, D. J. Hutton, F. Slater, R. Peters, W. Gowling, C. E. Good, C. S. Hancock, A. J. Hancock (Hon. Sec.), and one visitor.

BIRD PROTECTION.—Mr. Hutton called attention to the urgent necessity in their own interests for protecting all insectivorous birds.

SEED EXPERIMENTS.—Mr. A. Sweetman sent sample of New Queen onions, of poor quality and unsuitable for this district. Mr. Hutton reported unfavorably of Neapolitan Maggiajola onion. Yellow stump-rooted carrot and Oxheart cabbage were good, and suited to the locality. Mr. Jacobs tabled field peas 3ft. high and well podded, from seed sown in February. Mr. H. McKinlay showed good samples of broom corn fibre and seed.

PROTECTION FROM WIND AND FROST.—Mr. Slater initiated a discussion on the necessity for windbreaks, and also for need of united action to prevent damage by frost. The Chairman thought it would be necessary to have thermometers in the garden, and when they showed that a frost might be expected fires should be lighted at intervals right through the valley.

BLACK SPOT.—Mr. Hutton reported having placed receptacles containing carbolic acid along the beds of potatoes for the purpose of preventing black spot, the idea being that the fumes from the carbolic would be effective. The experiment, however, was a failure [This alleged cure is frequently coming to light. No other result but failure could be expected. It is just possible that the smell might have kept some kinds of insects at a distance, but to expect fungus diseases to be destroyed under such circumstances is absurd.—GEN. SEC.]

Bakara, May 3.

Present—Messrs. R. Barrow (chair), A. Lehmann, J. V. Barrow, H. R. Hayward, E. J. Dietrich, E. Wall, F. E. H. Martens (Hon. Sec.), and one visitor.

POISONING PARROTS.—Mr. Hayward reported having destroyed parrots with boiled wheat and strychnine.

POULTRY COMPLAINT.—Mr. Lehmann stated his fowls were dying through a growth in the throat. [This report was received twenty-four days after the meeting was held; the information given is also very vague. Under such circumstances it is out of the question to expect the General Secretary to furnish any information as to cause and cure of complaint.—GEN. SEC.]

SEEDING.—Mr. Hayward was of opinion that, under favorable conditions, a crop scarified in would give results equal to a ploughed-in crop.

Dowlingville, May 2.

Present—Messrs. J. Phelps (chair), T. Roberts, R. A. Montgomery, T. Illman, R. Foggo, T. W. Lee, Thos. Lomblad, G. Mason, H. Crowell, G. Inkster, T. Lock, and J. L. Broadbent (Hon. Sec.).

OFFICERS.—Chairman and Hon. Secretary re-elected.

EXPERIMENTS WITH WHEATS.—Mr. H. Crowell reported results of trials with wheats last year. [Hon. Secretary's report simply gives the names of the wheats and a certain number of ounces, thus, "Purple Straw, 23ozs." To convey any information, the report should have stated variety of grain, area of plot, quantity sown, date when sown, date when ripe, yield per acre, nature of soil, rainfall during growing season, and any other information affecting the experiment.—GEN. SEC.]

PICKLING OR WASHING SEED WHEAT.—Mr. Foggo washed some of his seed wheat by putting it loose into water; then he dried it. The crop from the washed wheat was practically free from bunt, whilst that from seed pickled with bluestone was badly affected with bunt.

Finniss, May 6.

Present—Messrs. W. W. Heath (chair), S. Eagle, F. Dreyer, and S. Collett (Hon. Sec.).

MANURES.—Members think that a mixture of fertilisers is needed in this locality, so as to provide the nitrogen, potash, and phosphoric acid required by plants. It might be well to have an analysis of the soil, in order to discover what fertilising matters are deficient. [It would be cheaper and better to try strips across the field, fertilising one with potash, one with phosphate, and another with nitrogenous manure. Other strips could be tried with mixtures of two or even all of the above, and strips between could be left without fertilisers. Analyses of soil would give results only on particular spots, and the soil 6ft. off might be totally different.—GEN. SEC.]

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and Found Employment by Government Departments and Private Employers from April 29 to May 30, 1901.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	145	269	393
Carpenters	9	5	8
Bricklayers, masons, &c.	4	7	14
Boilermakers, blacksmiths, and assistants	7	9	26
Ironmoulders	5	—	—
Fitters and turners	4	1	1
Enginedriver and fireman	5	—	2
Apprentices	16	3	—
Cleaners	15	16	7
Carriage-washers and junior porters.....	24	25	3
Painters	14	1	—
Cook and sculleryman	2	—	2
Miners	5	—	12
Stonebreakers ..	—	—	9
Farm hands	—	—	2
Rivet boys	7	—	15
Ironworker	1	1	1
Brassfinisher	—	—	1
Pipe jointer	—	—	1
Shipwright	—	—	1
Cameldrivers ..	—	—	2
Sailmaker	—	1	—
Ironmonger	—	1	—
Electrician	—	1	—
Mariner	—	1	—
Female attendants	—	—	2
Carriage trimmer	1	—	—
Compositors....	2	—	—
Totals	266	341	502

May 30, 1901.

A. RICHARDSON, Bureau Clerk.

The Factories Acts.

CONTRIBUTED BY CHIEF INSPECTOR BANNIGAN.

(Continued from Page 856.)

Every occupier of a factory shall keep the same in a cleanly state, and ventilated in a proper manner, as prescribed by regulation; and no occupier shall allow his factory to be so overcrowded while work is carried on therein as to be injurious to the health of the persons employed therein. Any occupier neglecting to comply with this section shall be deemed to have committed a breach of this Act.

No person shall employ in a factory a woman, or young person, or child, for more than forty-eight hours in any one week; but, on notice to an inspector in manner prescribed, a woman or young person may be employed for not more than sixty hours in any one week, provided that the aggregate number of hours of employment of such woman or young person above forty-eight hours per week shall not exceed one hundred hours in any one year: but this clause shall not apply to factories for preserving fruit, or other perishable articles, during the months of December, January, February, March, and April.

If a woman or young person is employed by the same employer during the same week both in a factory and in a shop, the aggregate hours of employment of such woman or young person shall not exceed the number of hours mentioned in section 13 of the principal Act.

No child shall be employed in any factory: Provided that any boy or girl that has passed the compulsory educational standard may, if the inspector think fit, be so employed.

An inspector may at any time require any young person employed in a factory to procure satisfactory proof of age, or a certificate from a legally-qualified medical practitioner as to the fitness of such young person for such employment. Notice of such requisition shall be given to the employer: and, in such case, it shall be a breach of this Act to further employ such young person until such certificate shall have been obtained.

All factories in the same line of trade, or any of them, may be named in the certificates of fitness for employment.

In every factory the following rules shall be observed:—

- (I.) A woman or young person shall not be employed for more than five hours without an interval of at least an hour for a meal.
- (II.) A woman or young person shall not, during any part of the time allowed for their meals, be employed in the factory:

Any woman or young person so employed shall be deemed to be employed in contravention of the provisions of this Act.

The Minister may, by notice in writing, forbid the occupier of a factory where noxious trades are carried out to permit any employés therein to take their meals in any room while work is being carried on therein; and may, by notice in writing, direct an occupier to erect or provide a suitable room or place in the factory, or in connection therewith, for the purpose of a dining or eating room for employés in such factory.

If the occupier fail to comply with such notice within a reasonable time the factory shall be deemed not to be kept in conformity with this Act.

- (I.) In each factory in which any woman or young person is employed there shall be posted in a conspicuous place, so as to be easily read, a written or printed notice specifying the hours of employment in such factory.
- (II.) A true copy of such notice shall be signed by the occupier, and shall be forwarded to an inspector in manner prescribed.
- (IV.) In any proceedings against the occupier of a factory for employing any person in excess of the hours of employment permitted by the principal Act, the contents of the notice affixed by occupier containing the holidays and working hours of the factory shall be conclusive evidence of the facts therein stated.

Journal of Agriculture

AND

Industry.

No. 12. REGISTERED AS]

JULY, 1901.

[A NEWSPAPER. VOL. IV.

NOTES AND COMMENTS.

The early part of June remained dry, but splendid soaking rains were experienced over all the mid and lower north and Southern agricultural areas about the middle of the month. In most parts the ground has had a thorough soaking, removing any fears of the seed having malted. In the far northern wheat areas, however, conditions remain most unpromising, there having been insufficient rain to bring the wheat through the ground. Feed is also conspicuous for its absence, and the position of many of the farmers is desperate. Throughout the State the latter part of June has been cold and frosty. Feed makes but little progress, and will not be nearly so plentiful as last year. The cold weather and scarcity of feed has resulted in considerable losses of lambs. The pastoralist has also to complain of absence of rain and feed over extensive areas of country.

As will be seen from the report of the Inspector of Fertilisers in another portion of this issue, the past season's operations in commercial fertilisers has again shown a large increase over the previous season. The Inspector estimates that for the past seeding to wheat South Australian farmers have paid £141,775 for 31,400 tons of manure. Few people have an adequate conception of what this means to South Australia. To Professor Lowrie, Mr. Parsons, of Minlaton, and the Agricultural Bureau most of the credit of this innovation in South Australian farm practice is due. There is no doubt that the extension of the practice would have been much slower but for the fact that the Bureau affords an unrivalled means of dissemination of information amongst the cultivators of the soil. The satisfactory returns of last year induced a number of farmers in the drier areas to experiment with these fertilisers, and it is most unfortunate for them and for the community generally that the season in these areas should have been so exceptionally dry. It remains now to be proved whether the seed will be injured by being in contact with the manure for so long before the rain falls in sufficient quantity to cause it to germinate. If the fears on this point prove unfounded a very large increase in the area of wheat put in with the seed and fertiliser drill may be confidently expected.

Well, Professor W. Lowrie, M.A., B.Sc., Principal of the Roseworthy Agricultural College, has decided to abandon his position at the college in South Australia in favor of an appointment to a similar institution in New Zealand. A very large number of our farmers and others regret his decision to leave us.

especially as he has been for some time conducting a series of experiments to demonstrate the profits that can be secured from the use of certain quantities and varieties of manures and the growth of some of the more prolific and hardy varieties of cereals. In New Zealand our friend will find a milder climate, and in the particular part that he is about to reside he will have better conditions than at Roseworthy for carrying out his ideas on breeding of farm stock and growing various crops; but he will not find a body of settlers who will think more highly and respect him more generally than those he is leaving in South Australia.

Impurities in water supplies of factories and dairies are not uncommon, and experiments conducted by the Dairy Instructor two years ago proved the extent of existing contamination. In the investigation of fishiness in butter samples of water from eighteen factories were submitted to bacteriological examination by Dr. McDonald, and chemical analyses by the Dairy Instructor, and out of that number only four were regarded as pure. Further scientific tests have been conducted, and last April a bacteriological analysis was made of butter that had been refrigerated for three months, and well-developed colonies of water organisms were cultivated in Pedni plates. The plates are shown in the May *Journal of Agriculture*.

Dr. John Hay, proprietor of the Berry Central Creamery, one of the largest and most complete establishments of the kind in New South Wales, is a strong advocate for pasteurisation of milk intended for butter-making. Speaking at the annual dinner of the suppliers to the central and supplying factories, he told the farmers that he received a clear $\frac{1}{2}$ d. per pound more for pasteurised butter than for their best quality ordinary butter. This represented £4,500 during the year. The prime pasteurised butter realised $\frac{1}{2}$ d. per pound and the next quality $\frac{1}{4}$ d. per pound above ordinary top market rates. Two years since pasteurising of milk was adopted at some of the supplying factories, and Dr. Hay said he was a stronger advocate than ever of the practice.

It is reported from Victoria that some cattle recently imported, and now undergoing quarantine, have been found to be suffering from the dreaded bots, or warbles. The insect is different from the horse bot, and far more destructive. The "bots," or "maggots," burrow in the skin of the beast attacked, causing what are known as warbles in the hide, making the parts attacked quite worthless for manufacturing purposes. The bot or warble fly has cost Great Britain millions of pounds, and it has been found impossible to exterminate it. The loss to Australasia if it gets a hold here would be ruinous to cattle-owners, and it is pleasing to learn that effective measures are being taken by the Victorian authorities to deal with the matter. It is stated that several years ago some cattle imported into New Zealand were found affected, but fortunately the action taken to stamp out the pest was successful.

It is estimated by the best authorities that the quantity of phosphate rock required last year to supply the world's demands was 2,850,000 tons, a vast amount to mine, handle, wash, and place on shipboard; and, as Europe alone consumed nearly 2,000,000 tons, it may be of interest to state that the sources

of supply were as follows :—Florida, 500,000 tons; South Carolina, 100,000 tons; Tennessee, 150,000 tons; Africa, 400,000 tons; France, 350,000 tons; Belgium, 300,000 tons; and Russia and Norway, about 50,000 tons. In addition to this, about 900,000 tons were consumed in America and 50,000 tons in Japan and Australia.—(Foreign Office Annual Series, 2,572.)

Mr. W. J. Hannaford, of Gumeracha, utilises all culls and surplus apples for the manufacture of cider vinegar. Where there is a considerable area under cultivation for apples and pears, even where there is no codlin moth to trouble the grower, it should pay him to manufacture cider vinegar from the waste or surplus fruit. Cider vinegar is one of the best for all purposes where vinegar is used, and it possesses a great advantage over the injurious compounds of acids and coloring, in so far that it is clean and wholesome.

A profitable industry could be started and a most wholesome health-maintaining summer beverage provided were the manufacture and sale of a vile, poisonous compound of acids and water prohibited. There is a beverage sold under the name of "cider" which contains nothing that ever belonged to fruit of any kind. The acids from which it is made and the flavorings and colorings are dangerous to health and injurious to the stomach; but the cost of manufacture is so low that pure cider, made from apples and pears, cannot be brought into competition with the diabolical imitation.

It is stated that in Columbia (South America) landowners troubled by the prickly pear (*Opuntia* sp.) have found a cheap and effective means of destroying the plants. In the rainy season bushy lianas or creepers, growing rapidly and producing dense foliage, are planted round the clumps of prickly pear. When they cover them completely they are cut down and burnt in the summer. Most of the prickly pears are destroyed, the operation being repeated at a later date. A third burning may sometimes be necessary. It is essential that a dense growth of vegetation be obtained over all the pears, so that the heat will be sufficient to affect the tissues of the leaves. The common dolichos would be very suitable for this purpose.

At some of the American agricultural stations it has been shown that an alkaline condition of soil is conducive to scab in potatoes. To correct alkalinity—for instance, in limestone or marly soils—it is suggested to use acidulous manures. One grower claims to have effected this purpose by ploughing under a crop of green rye before planting his potatoes.

It is a curious fact that underground draining or tiling regulates the humidity and temperature of the soil. During wet weather the surplus water is carried off by the drains, and when the weather is dry and warm the air (being moist) enters the drains, becomes cooled, parts with some of its moisture, and thus maintains a damp condition in the soil. When the soil is aerated, even by cultivation, a similar condition of soil is maintained—absorption of moisture from the air in summer and abstraction of moisture from the soil in winter.

There can be little doubt that the rolling of land after sowing a cereal crop is beneficial in many ways; but harrowing (or horse-hoeing where the seed has been drilled) afterwards, when the plants have been well rooted, is necessary. The rolling settles the soil on to the seed and helps to ensure a good germination; the roller crushes clods and levels the soil, thus saving a deal of jolting on the expensive harvesting machinery, and making work easier for the horses. If the crop is reaped with the binder or cut with the mower it can be cut much closer to the soil when it is smooth and level. But rolling tends to promote caked surface; therefore the harrows or horse-hoe should be put on to loosen up the surface, to let in air, promote absorption of moisture, and to prevent evaporation through capillary attraction.

During July and August every effort should be made to flood the orchards, vineyards, and gardens situated on hillsides, slopes, and dry flats in those parts of South Australia where the annual rainfall does not average over 18 in. The roadsides and hillsides can be used in many places as catchment areas, and the water can be diverted into trenches, from whence it will soak away into the subsoil. After this the trenches should be filled in and the whole area hoed over. A thorough soaking of the subsoil during these two months will ensure good crops of fruit or vegetables later on.

Mr. J. C. Ruwoldt, of Mount Gambier, manured eighteen acres of a field of twenty-seven acres with 2cwts. of bonedust per acre, and left nine acres without manure. He put ninety sheep, ten cattle, and nine horses into the field in September, and by the end of February there was still grass 1ft. high, and all the sheep and cattle fat and very healthy. They cared, however, very little about the nine acres which were not manured.

TEMPORARY WIND BREAKS.

Mr. George Monks, of Forest Range, recognising the necessity for sheltering his plants and trees from the bleak and oftentimes strong gully winds, and with a view to protecting the plants which he is growing to serve as a permanent wind break, has adopted the following device:—Procure a sufficient number of saplings, about 12ft. long and 10in. thick at the butt; char them about 2ft. up, to prevent them rotting too soon. Plant these upright 12ft. to 14ft. apart, and 2ft. deep, fix a capping on top, strain seven wires, or fix seven saplings on these posts, and then thatch in or plait in teatree, reeds, rushes, raspberry canes, or other convenient material.

Mr. Monks has constructed a short piece of wind break on the above principle at his place, and finds it acts very well. The editor has seen a good many excellent sheds, stables, sties, &c., in various places, made with posts, wires, and teatree, broombush, reeds, bulrushes, and other materials growing naturally in the various localities. Shelters made by plaiting or “wattling” in teatree or broombush have been known to last good for a quarter of a century.

In the Mount Lofty ranges the blackwood tree (*Acacia melanoxylon*) grows naturally. They grow quickly to a considerable height, with branches rather low down; are very handsome, and the timber is of value. They throw up suckers and can be transplanted.

HAND-FEEDING OF COWS FOR MILK AND BUTTER PRODUCTION.

BY G. S. THOMSON, N.D.D., GOVERNMENT DAIRY INSTRUCTOR.

The deficit in butter during the last months of summer, and the benefits that can be obtained by a system of hand-feeding of milking stock, has shown the necessity for conducting a series of experiments. Work in this particular line was still further required, as dairymen held adverse opinions relative to the milk-producing properties of the commonest foods sold. Many ridicule the practice of hand-feeding on the basis of the cost incurred, and the slow and unstable influence which foods are said to exert upon the milk flow and its butter-fat percentages. Hand-feeding in South Australia in the dry months of the year, when nutritious fodder is scarce in the paddocks, is sorely imperative. With paddock food as the only support, milking cows must suffer in constitution, and, if these trying circumstances are permitted to continue, emaciation of the body is a natural consequence. Animals with marked milking attainments will become seriously reduced, as more digestive food will be converted into milk at the cost of the cow's vitality, hence the valuable milking stock suffer extreme and permanent injury; also the less profitable milkers depreciate in bodily value. Further, the constitutions of the strongest cows are undermined, functional derangement and diseases of the organs are encouraged, and many animals succumb to ailments brought on by no other cause than sheer starvation. And this does not end the danger arising from scanty feeding, for the unborn calf is deprived of the support which should be given by a healthy vigorous mother, and the future cow will therefore be weak in constitution and unable to continue the life of a profitable milker.

Where the greatest response from systematic and judicious feeding becomes evidenced is amongst animals less fortunate than the well-cared for cow, and where the milking qualities have been suppressed in their development. A well balanced and succulent food will essentially raise the quantity of a cow's milk if the previous course of feeding has lacked in the required constituents and moisture, and it is a belief that has unfortunately become established amongst many dairymen that feeding will reduce the weight of milk when it influences the fat percentage and total solids to a high standard. Hand-feeding, when done in conjunction with careful milking and close attention to other matters of importance, will raise both the quantity and quality of the milk yield from the average cow, and the increase can be maintained by changing the rations from time to time. Some people might call such a system forced feeding, inflicting injury on the health and future milking capabilities of the animal; but it is not the case so long as the food is wholesome and free from injurious properties, and not given in excessive and irregular quantities. Feeding the already well-nourished cow, however, with food of a rich albumenoid ratio will not raise the standard of her milk to a higher degree, and to be maintained for a length of time. She has already reached her maximum attainments, and what is not required for milk production will, according to her fattening propensity, be converted into flesh or excreted from the body. It is here where the old maxim, "Feed for quantity and breed for quality," cannot be exploded.

From a study of the work to follow readers will have sufficient evidence to show that hand-feeding demonstrates its value by increasing the quantity and quality of milk, by providing a healthier body in the cow; and, with the latter condition maintained, we will expect to find a healthy foundation in the young and future stock.

THE TESTS.

The tests enumerated in this paper were commenced in the second week of March by Messrs. Crawford, of Normanville; Wyllie, of Kapunda; and Ridgway, of the Grange, and continued until the end of May. To these gentlemen, who carried out the respective duties of weighing the food, taking the fat percentages, and weighing the milk, I am greatly indebted; and I can assure readers that all precautions were adopted to furnish reliable results. Along with the above duties Mr. Crawford kept a register of the cream returns, and a full account of the churning and butter manufactured throughout the working of the experiment. Mr. Wyllie did likewise, and extended the testing by conducting other experiments of an important character. In the special milk and acidity determinations I have to thank Messrs. Lauterbach, of Wilmington Dairy Factory; Davidson, Millicent; and Leditschke, Point Pass; and Mr. Gofder, F.C.S., Government Analyst, for a number of quantitative analyses of samples of butter,

Determinations and Analyses Made.

The following are the total number of samples tested, weights of milk taken, together with the quantitative analyses of butter and milk. With the acidity determinations these figures will give an idea of the extent of the investigation and the amount of labor that was attached to the experiment:—

Determinations of butter-fat in milk	2,092
Weights of milk taken	1,372
Lactic acid determinations	775
Analyses of butter	10
Analyses of milk	6
Total	4,255

In reviewing the work accomplished it must be made clear that the feeding trials were not conducted with a view to test the merits of a large number of rations, but to find out the best of those practised in the State. To furnish authentic proof of the qualities of foods given it would be necessary to carry on experiments for months, and to allot for each particular mixture a term of feeding that would extend for at least fourteen days. Again, in changing the food it is deemed advisable to defer making tests and weighing the milk until the cows have become accustomed to the new diet, when the constituents of the previous ration will not interfere with the digestion of the fresh food, and adversely influence the yield of milk. In our trials we have shortened the customary duration of feeding to ten and seven days, respectively, and no time was given betwixt the change of rations for reasons explained in recording the experiments. Further, our system of feeding does not include a great variety of foods, and our cows were not fortunate in having the advantage of abundance of green growing fodder and a variety of straw. It will be understood, in carrying out feeding trials in South Australia, that a variety of conditions have to be considered which are not common in other countries, hence the results will differ in some respects from those found elsewhere. Readers might take notice of the ready response that the test cows gave to the change in rations, and it may be said that the ration containing Sunlight oilcake (copra) claims a high position as a nutritive and stimulating food. The milk-producing properties are very pronounced, and much testing would be necessary before one could determine the extent of its true qualities. In the experiment a striking illustration of the value of copra-feeding, and one of particular importance in a hot climate, was the higher melting point and solidity of the butter manufactured, and at the same time the good properties of the product were retained. Some proofs of these attainments will be found in the quantitative analyses and practical examinations given.

Preparing the Food.

Throughout the tests the instructions required the preparation of the food in a suitable vessel every evening, and on no account was cold water to be used. Hot water was poured on the mixture, and after sufficient stirring the food was covered over with bags, and allowed to ferment during the night. In this condition the cows were allotted their proportions of the ration at the hours customary for feeding on the farm. The rations were based on the food requirements of small-framed cattle. The larger breeds would, of course, require more generous feeding.

Test 1.

The following are the names of cows tested, with class, age, and number of days in milk.

Name.	Class.	Age, Years.	Days in Milk.
1. Olive.....	Three-fourths Jersey	5	66
2. Bally.....	Half-bred Ayrshire	5	226
3. Daisy.....	Ayrshire	8	232
4. Brenda.....	Ayrshire	5	235

Hours of milking, 3.45 a.m. and 3.45 p.m.

These cows, previous to the test, were fed daily on rations rich in milk-forming constituents, and their milking propensities were brought to a high state of perfection. The practice of the owner was to change the ration from time to time, and to adopt every precaution in the treatment of the cows that would be liable to interfere with their milk-producing qualities. The cows were fed immediately before milking, morning and afternoon, at 3.45 a.m. and 3.45 p.m., and each received an equal weight of food at both meals.

The following is the ration fed to the four test cows before the commencement of the experiment:—Hay chaff, 40lbs.; bran, 12lbs.; water, 40lbs.; salt, $\frac{1}{4}$ lb. Approximate weight per cow per day, 23lbs. or 11 $\frac{1}{4}$ lbs. each meal.

The rations given throughout the tests did not exceed a period of ten days, as longer time could not be spared owing to the approaching winter, and to continue the rations for weeks would not have justified the delay and expense in a country like South Australia, where the climate demands changes in food.

To avoid the article being burdensome, and without omitting what is really necessary to the reader in making clear the value of the experiments, I will quote the fat percentage in the milk yielded on the fourth and seventh day of each term of feeding, in tests 1 and 3.

Fat Percentages from the above Ration.

	Fourth Day.		Seventh Day.	
	Morning per cent. Fat.	Evening per cent. Fat.	Morning per cent. Fat.	Evening per cent. Fat.
Olive	4.8	5.2	5.0	5.2
Bally	4.8	4.8	4.8	4.8
Daisy	5.0	4.8	5.0	5.0
Brenda	4.6	4.8	4.8	4.8

A second ration of chaff, 60lbs.; Sunlight oilcake, 8lbs.; water, 20lbs.; salt, $\frac{1}{4}$ lb., gave an increase in the fat percentage; but the third ration, including bran with the copra, exceeded the second.

Ration 3.—Hay chaff, 60lbs.; copra, 6lbs.; bran, 2lbs.; water, 20lbs.; salt, $\frac{1}{4}$ lb., or 22lbs. per cow per day, or 11lbs. each meal.

	Fourth Day.		Seventh Day.	
	Morning per cent. Fat.	Evening per cent. Fat.	Morning per cent. Fat.	Evening per cent. Fat.
Olive	5.0	5.2	5.2	5.2
Bally	4.0	4.0	4.8	5.0
Daisy	5.2	5.2	5.0	5.2
Brenda	5.2	5.2	5.2	5.2

In the fourth ration 4lbs. of patent roller flour was substituted for copra, and 12lbs. of bran, 40lbs. of hay, and water were given. The percentage of fat was a shade higher.

Ration 5.—Hay chaff, 40lbs.; copra, 8lbs.; bran, 12lbs.; water, 40lbs.; salt, $\frac{1}{2}$ lb., or 25lbs. per cow per day.

	Fourth Day.		Seventh Day.	
	Morning per cent. Fat.	Evening per cent. Fat.	Morning per cent. Fat.	Evening per cent. Fat.
Olive	5.2	5.2	5.2	5.2
Bally	5.0	5.0	5.0	5.0
Daisy	5.0	5.2	5.2	5.2
Brenda	5.0	5.0	5.0	5.0

The sixth ration was similar to No. 5. and the fat tests obtained on the fourth and seventh days were exactly the same, thus showing that the cows had reached their maximum standard in quality of milk.

To ascertain how long this ration would continue favorable to the production of butter fat and yield of milk a further test of ten days was allowed, making a total of thirty days.

The following are the results, which are almost corresponding with No. 5, or the first of the month's rations:—

	Twenty-fourth Day.		Thirtieth Day.	
	Morning per cent. Fat.	Evening per cent. Fat.	Morning per cent. Fat.	Evening per cent. Fat.
Olive	5.2	5.2	5.2	5.2
Bally	5.0	5.0	5.0	5.0
Daisy	5.2	5.2	5.0	5.2
Brenda	5.0	5.0	5.0	5.0

Weights of Milk, Morning and Evening.

The great regularity in the morning and afternoon milking will be seen in tables to follow, which comprises the seventh, fourteenth, and thirtieth days:—

	Fifth Ration.					
	Seventh Day.		Fourteenth Day		Thirtieth Day.	
	Morning. Lbs.	Evening. Lbs.	Morning. Lbs.	Evening. Lbs.	Morning. Lbs.	Evening. Lbs.
Olive	12	12	12	12	12	12
Bally	10	10	10	10	10	10
Daisy	16	16	16	16	16	16
Brenda ..	15	15	15	15	15	15

To the ordinary dairyman these records will seem phenomenal, but nevertheless they are absolutely correct. In American literature I find that Professor Dean expressed his opinion at a meeting, in which he believed that the quantity and quality of a cow's milk could be maintained morning and afternoon if care were devoted to feeding, sheltering, watering, and regularity in milking and good treatment of the cows. Consider how these words are borne out in the tables given, and the manner in which the cows were treated.

The first test in this experiment was conducted on the farm of Mr. Wyllie, of Kapunda. This gentleman is a most exemplary dairyman in his systematic methods, notwithstanding that less fortunate dairy farmers sometimes designate such systematic methods as "faddy."

But in farming, as well as in scientific circles, experimentalists are often classed as faddists. When discussing Mr. Wyllie's system of dairying, however, a farmer in the Kapunda district remarked that Mr. Wyllie, and men who worked on similar fads, certainly made them pay. This is what is desired; hence let all dairymen adopt the profitable fads.

As bearing out Professor Dean's statements, I will quote the questions which I submitted to Mr. Wyllie, and give the answers.

How do you account for the even supply of milk given by your cows morning and evening?—Equal times of milking, punctuality in hours of feeding, keeping

them uniformly warm, avoiding excitement and worry, energetic milking uniformly done, thorough stripping, and keeping the milk secretion in perfect working order.

How do you account for the morning and evening's percentage of fat corresponding?—The same answer as above will apply to this question. A great many variations in the butter fat tests in milk supplied to factories could be avoided if the above were carefully attended to. I had that proof conclusively demonstrated when I was separating milk for farmers around Kapunda and making their butter. One supplier's milk never varied in quantity or quality, the same results being obtained week after week from the same number of cows, while others were ever irregular.

Did you observe these valuable characteristics when you started dairying first?—No; certainly not. I knew a good cow when I saw one, and I was fortunate in the purchase of my cows. I possessed a fair knowledge about feeding and milking; but I have learned as much in the seven years I have had this dairy as I did in all my previous experience of dairying.

Does your experience prove that care in milking has increased the yield of milk?—That is what it has done.

Have you anything particular to say about the drinking-water for cows, and the quantity required for an animal in full milk?—For the production of good-keeping milk my experience shows that the drinking-water must be pure, and, what is of great importance, it must be near the cows, otherwise they will not travel the distance to obtain it. The average quantity drank by a cow in summer is 10galls.

Cost of Prepared Food for the First Week of each Ration, and the Value of Butter Produced from the Four Test Cows

	Weight of Milk.	Weight of Cream.	Weight of Butter.	Cost Price of Ration per Week.	Value of Butter at 1s. 3d. per lb.
	lbs.	lbs.	lbs.	£ s. d.	£ s. d.
Ration 1	780	68	39	0 9 4	2 8 9
Ration 2	780	68	39	0 12 10	2 8 9
Ration 3	760	71	41	0 12 10	2 11 3
Ration 4	742	74	42	0 10 6	2 2 6
Ration 5	742	73	42½	0 12 10	2 13 1½
Second week	742	72	41½	0 12 10	2 11 10½
Third week	742	72½	42	0 12 10	2 12 6
Total for seven weeks	5,288	498½	287	4 4 0	17 18 9

The above is a splendid record. The value of No. 5 ration is well demonstrated in butter production, and its continuation for three weeks to maintain a high standard gives it a premier position in the experiment. This result is highly creditable when we consider the period of lactation in the cows. Not alone is the milk rich in fat, but the quantity yielded throughout the seven weeks is most satisfactory.

By giving the butter ratio of cream and the number of pounds of milk required to make 1lb. of butter, the good influences of the rations will be more clearly put forward.

	Quantity of Cream to make 1lb. of Butter.	Quantity of Milk to make 1lb. of Butter.
Ration 1	1 7/8 lbs.	20·0lbs.
Ration 2	1 7/8 lbs.	20·0lbs.
Ration 3	1 7/8 lbs.	18·6lbs.
Ration 4	1 7/8 lbs.	17·6lbs.
Ration 5	1 7/8 lbs.	17·4lbs.
Second week	1 7/8 lbs.	17·8lbs.
Third week	1 7/8 lbs.	17·6lbs.

The quality of the butter was choice, and realised an average of 1s. 4d. per pound during the weeks of testing. In quoting, the price at 1s. 3d. in the table is taken to mean an average yearly return for the production in the State.

The tables and figures given are strengthened in importance when it is borne in mind that the cows had to depend on the rations, as paddock food was scanty, and contained very little nutritious constituents, and the results tabulated is powerful evidence in favor of hand-feeding, in conjunction with system and care, as a profitable means of carrying on dairy farming.

I might remind readers that the monetary calculations made in this paper will not refer to the real cost of production of butter, as local conditions and circumstances differ so much on individual farms.

Practical examinations and quantitative analyses of samples of butter will be given at the close of Test 2, also remarks on churning and butter-making. Hours of milking and other particulars will be considered at the end of Test 3.

Test 2.

Six cows were tested in this experiment, showing a variety in breeding, age, and period of milking. They are as follows:—

Name.	Class.	Age, Years.	Days in Milk.
Hilly	Jersey	5	240
Duchess	Ayrshire-Shorthorn	8	210
Violet	Ayrshire	4	180
Pansy	Shorthorn	3	90
Beauty	Shorthorn	4	90
Nora	Jersey-Ayrshire	4	90

Hours of milking, 7 a.m. and 5 p.m.

General Conditions.

The natural pastures were very dry and innutritious, the result of early summer rains having bleached the feed. Prior to commencement of test all cows on the dairy had a small armful of hay (8lbs.) put into their paddock each night; abundance of good water was close at hand. In this experiment the rations were given for seven days only. This was done purposely, to find out the changes in fat percentages and weight of milk such a practice would have.

In recording the fat percentages and weight of milk yielded per cow the daily averages are given, as the outcome of a considerable amount of work.

The food for the first seven days comprised what the cows picked up from the paddocks, with an armful of hay per cow each evening. The following is the result:—

	Percentage of Fat.	Weight of Milk. lbs.
Hilly	4.4	5
Duchess	4.0	9½
Violet	5.0	10½
Pansy	5.3	9½
Beauty	3.7	19½
Nora	3.4	20½

In studying the results attention should be directed to the lactation period of the cows, and observations made of the yield and quality of milk throughout the feeding.

Ration 1.—Hay chaff, 70lbs.; copra, 12lbs.; water, 40lbs.; salt, ¼lb.; or 20lbs. per cow per day.

	Percentage of Fat.	Weight of Milk. lbs.
Hilly	4.8	6½
Duchess	4.2	11
Violet	5.5	11½
Pansy	5.3	10½
Beauty	3.8	20
Nora	3.5	20½

At the end of the week there is a marked increase in butter-fat and 35 additional pounds of milk.

During the fortnight tests were made with other cows on the farm, and their values compared in the following order :—

1. Cows fed as usual, with an armful of hay at night ; decidedly going dry.
2. Cows getting dry chaff in addition to above ; barely holding their own.
3. Cows fed on No. 2, with 2lbs. crushed oats ; a little more than holding their own.
4. Cows fed as No. 2, with 2lbs. bran ; slightly better than No. 3.
5. Cows fed as No. 2., with 2lbs. of Sunlight oilcake (copra) ; better than No. 4.

There was a steady increase in butter-fats in Nos. 2, 3, 4, and 5 during the first week, but at the close of the second week the quality was falling.

Ration 2—Chaffed hay, 70lbs.; copra, 8lbs.; bran, 4lbs.; water, 40lbs.; salt, $\frac{1}{2}$ lb.; or 20lbs. per cow per day.

The average morning and evening butter-fat percentages are given in the rations to follow.

	Percentage of Fat.		Weight of Milk. Lbs.
	Morning.	Evening.	
Hilly	5.1	5.4	8
Duchess	4.0	5.4	12
Violet	4.5	5.7	12 $\frac{1}{2}$
Pansy	5.2	5.9	11 $\frac{1}{2}$
Beauty	3.8	4.6	19 $\frac{1}{2}$
Nora	3.8	4.1	21

With the addition of bran the fat percentages have remained high, and there was an increase of 75 $\frac{1}{2}$ lbs. of milk compared with the first feeding.

Ration 3.—Cows were fed on Ration 2, with the bran omitted.

	Percentage of Fat.		Weight of Milk. Lbs.
	Morning	Evening	
Hilly	5.0	5.2	8
Duchess	3.8	5.1	11
Violet	4.2	5.2	11 $\frac{1}{2}$
Pansy	4.8	5.4	10 $\frac{1}{2}$
Beauty	3.7	4.3	19
Nora	3.2	3.8	18 $\frac{1}{2}$

The percentage of fat has fallen, also the weight of milk ; still there is an increase against the first milking. The reason of the change is very obvious, and is of considerable importance in dairying. During the week of ration 3 a complete change in the weather set in, the warm days being followed by five days of cold bleak winds accompanied by a rainfall of 2.31in. A strong plea in favor of shelter and protection of cows will be given under the heading of "Lessons from the Tests," and I would recommend dairy farmers to seriously consider the question.

Ration 4.—In this ration we have a repetition of No. 2 (copra and bran).

	Percentage of Fat.		Weight of Milk. Lbs.
	Morning.	Evening.	
Hilly	4.9	5.8	8
Duchess	3.9	4.6	12 $\frac{1}{2}$
Violet	4.2	7.2	12 $\frac{1}{2}$
Pansy	5.1	5.3	12 $\frac{1}{2}$
Beauty	3.2	4.8	20
Nora	4.1	4.2	20 $\frac{1}{2}$

With an improvement in the weather, and a change of ration, the maximum quantity of milk has been attained in test 2, and the yield of butter fat shows a distinct increase compared with the previous feeding. As already mentioned, test 1 has shown that one ration repeated for thirty days kept the standard

of fat high and yield of milk steady. Still readers will agree to favor an alteration in the food constituents from time to time. We are aware, from actual practice on the farm, that changing the cows from paddock to paddock every few days returns an increase in the quantity and quality of the milk given; and the same will apply, but in a more pronounced degree, to stall and hand feeding.

An important feature in the latter test is the repeated evidence which is given that the milking propensities in the cows can be made to reply to a well-balanced ration when fodder in paddocks is scarce and low in nutriment.

Further on in the experiments I will refer to the marked changes in the fat percentages of the morning and afternoon milk, and its comparisons in the three tests, and I would urge every dairyman to give the subject close and careful study.

The following are the weights, in pounds, of milk given for each week of the five rations:—

Ration A.	Ration 1.	Ration 2.	Ration 3.	Ration 4.
512½lbs.	554½lbs.	588lbs.	547½lbs.	602lbs.

In consideration of the want of natural herbage during the experimental months, it is clear that, without resorting to well-balanced rations, the best cows would naturally have gradually decreased in their milk flow, and those approaching calving would have dried off rapidly. This valuable evidence in favor of hand-feeding must not be overlooked while perusing these pages. From the above figures a lesson will be found that ought to impress farmers and cowkeepers who are unfortunately prejudiced against the necessity of providing cows with daily rations of nutritious food. A noticeable increase is shown in the weight of milk during the first three weeks of the test. In the fourth week a fall of 40½lbs. is recorded, for reasons already explained, while the fourth ration is credited with 602lbs., or 89½lbs. more than ration A.

Weight of Butter, in Pounds, for each Week of the Five Rations.

Ration A.	Ration 1.	Ration 2.	Ration 3.	Ration 4.
25lbs.	28½lbs.	29½lbs.	26lbs.	31lbs.

The weights of butter in this test correspond with the increase and decrease in the milk supply. The weather conditions during the week of ration 3 show out clearly in the 26lbs. of butter manufactured, and should give further expression for the necessity of providing shelter for milking stock. The above totals speak strongly for the objects of this experiment.

Ratio of Milk to Butter.

The following is the weight of milk required to produce 1lb. of butter:—

Ration A.	20·5lbs. of milk to 1lb. of butter.			
" 1.	19·4lbs.	"	"	"
" 2.	19·9lbs.	"	"	"
" 3.	21·0lbs.	"	"	"
" 4.	19·4lbs.	"	"	"

It must be understood that these figures are calculated from actual practice on the farm, and are not in any way associated with tables. The same is said of all other records.

Points about Cream and Churning.

Throughout the experiments every possible care was taken to ripen the cream thoroughly, and equal quantities were kept from the milk of cows fed in the ordinary manner, as practised previously to the commencement of testing. The comparisons will afford us useful information of the consistencies of the cream, temperature of churning, and the solidity of the butter grains and the manufactured product. The first two lots of cream (rations A and 1) appeared to ripen equally well, but it was noticeable that the cream from ration 1 (copra) was

thicker. The ordinary cream was churned at 58° F., and the period of churning occupied fifty-five minutes. Cream from ration 1 was raised to 62° F., and churned in twenty minutes. Notwithstanding the higher temperature the butter grains were firmer. (*See* melting points of butter.) The percentage of butter fat in the milk from both lots showed equal traces; but on no occasion was the percentage high.

Ration 2.—The cream from the copra and bran fed cows thickened much more firmly than the ordinary cream, and the butter grains were firmer and time of churning less; and in rations 3 and 4 the same qualities were observed.

Throughout the experiment 1 lb. samples of butter were sent to the department each week for analyses. These were taken from the copra-fed cows and from cows fed without copra. Practical tests were also made of the samples, which will be given after the analytical results.

Analyses of Samples of Butter from Copra-fed Cows, and from Cows not fed on Copra.

	Percentage of Fat.	Percentage of Water.	Melting Point	
TEST 1—				
Ration 1 {	86.12	10.54	89°	Copra
	85.69	10.3	88°	Without
TEST 2—				
Ration 1 {	90.59	6.68	89°	Copra
	90.49	7.07	79°	Without
Ration 2 {	89.27	7.13	90°	Copra
	89.63	7.58	89°	Without
Ration 3 {	89.11	7.26	84.5°	Copra
	87.68	8.36	91°	Without
Ration 4 {	88.07	9.40	91°	Copra
	88.07	9.05	90°	Without

The work of the above analyses was entrusted to Mr. Goyder, F.C.S., Government Analyst, School of Mines; and, in answer to a question on the method of taking the melting points and the difficulty of the operation, the following reply was received:—

Adelaide, June 17th, 1901.

Sir—With regard to the melting point of butter—this point was taken by filtering the butter, melted over a water bath, into a test tube lin. in diameter, and immersing into a beaker holding half a gallon of water, which was allowed to cool slowly from 100° F., the tube being tested from time to time, and the thermometer read when the butter just ceased to flow when the tube was held horizontal. The melting point was also noted with the temperature slowly rising, and the reading taken when the butter flowed slowly when the tube was held horizontal; and if the two readings agreed, the mean was taken as the melting point.

This method appeared to give more concordant results than any of the others mentioned in the text books, and also to give nearly the same melting points as would be yielded by the softening of the butter due to the natural heat of the season.

Some of the other methods give much higher melting points, especially where the thermometer is read when the butter becomes clear. Other methods give much lower melting points.

You are doubtlessly aware that in the case of a heterogeneous substance such as butter it is exceedingly difficult to find a fixed melting point, as some of the constituents have much higher melting points than others, and the mixtures have not intermediate but various melting point.

Yours faithfully,

G. A. GOYDER, Analyst and Assayer.

In the analyses it is noticeable that the percentages of fat are higher in the butter from copra feeding, and in three instances the percentage of water is lower; but much importance cannot be placed on the latter, owing to the influence working exerts on water percentage. The melting points which have been referred to by Mr. Goyder are higher in all the copra samples but one, and the practical examinations showed a decided hardness in the same butter compared with the other samples.

Practical Examinations.

In judging the butter, points were awarded for flavor, texture, color, salting, and general preparation; but it is unnecessary to quote other than flavor and texture in this paper. All examinations were made as soon as the butter was

received from the farms. A second examination was conducted three months after the first samples were tested. The butter was stored in a room of uneven temperature.

First Examination.				Second Examination.			
Flavor—45. Texture—20. Total—65.				Flavor—45. Texture—20. Total—65.			
Test 1—							
Ration 1.	<i>a</i> 43	19	62	<i>a</i> 32	18	50	Copra.
	<i>b</i> 42	19	61	<i>b</i> 30	18	48	Without.
<i>a</i> Possessed a more aromatic flavor.				<i>a</i> Rancid, and texture greasy.			
				<i>b</i> Increased rancidity.			
Test 2—							
Ration 1.	<i>a</i> 43	20	63	<i>a</i> 38	18	56	Copra.
	<i>b</i> 42	19.5	61.5	<i>b</i> 36	18	54	Without.
<i>a</i> Clean, but weak.				<i>a</i> Rancid.			
<i>b</i> Slightly sour.				<i>b</i> Increased rancidity.			
Ration 2.	<i>a</i> 41.5	20	61.5	<i>a</i> 35	18	53	Copra.
	<i>b</i> 42	20	62	<i>b</i> 30	18.5	48.5	Without.
<i>a</i> Was faintly bitter.				<i>a</i> Bitter.			
				<i>b</i> Marked rancidity.			
Ration 3.	<i>a</i> 41	19.5	60.5	<i>a</i> 38	18	56	Copra.
	<i>b</i> 41	19.5	60.5	<i>b</i> 37	18	55	Without.
<i>a</i> and <i>b</i> were both weak.				<i>b</i> Bitter.			
Ration 4.	<i>a</i> 43	20	63	<i>a</i> 35	18	53	Copra.
	<i>b</i> 42	19.5	61.5	<i>b</i> 35	18	53	Without.
<i>a</i> Acidic flavor.							

The practical examinations favor the copra samples. In the second examination the texture throughout was very much the same. Flavor was more or less rancid in the ten butters; but the extended time the butter was kept, and the want of refrigeration, favored the development of bad flavors.

Test 3.

In test No. 3 we have again cows advanced in lactation, and at a season of the year when a drying-off is looked for. Unlike the preceding two farms, where butter is manufactured, all milk from this dairy is retailed in the city.

General Conditions.

The rations were fed to the cows morning and evening, and immediately before milking, so that the cows were feeding during milking hours. In tests 1 and 2 a similar practice was conducted. In addition to the rations, the cows were allowed a small quantity of loose hay daily, as paddock herbage was very scanty and of poor feeding value. The support of the cows for milk and body requirements principally depended upon the dry food in the rations.

Name.	Class.	Age, Years.	Days in Milk.
Brindle	Crossbred Jersey	6	170
Rose	Ayrshire, Shorthorn	8	180
Daisy	Crossbred Jersey	3	150
Topsy	Crossbred Ayrshire	3	150

Hours of milking—5.30 a.m. and 12.30 p.m.

Ration A.—Chaff, 40lbs.; brewer's grains, 40lbs.; lucern, 40lbs., or 30lbs. per cow per day, or 15lbs. at each meal.

This ration was given for some time and up to the commencement of the experiments.

The fat percentages will be given for the fourth and seventh day of each ration. Each ration was fed for seven days.

Fourth Day.		Seventh Day.	
Morning per cent. Fat.	Afternoon per cent. Fat.	Morning per cent. Fat.	Afternoon per cent. Fat.
Brindle	3.8	4.4	4.0
Rose	4.8	5.6	6.0
Daisy	3.8	4.2	3.8
Topsy	4.2	4.8	3.8

Ration 1—Chaffed hay, 60lbs.; copra, 8lbs.; water, 20lbs.; salt, $\frac{1}{4}$ lb.; or 22lbs. per cow per day, or 11lbs. morning and afternoon.

	Morning per cent. Fat.	Afternoon per cent. Fat.	Morning per cent. Fat.	Afternoon per cent. Fat.
Brindle	3.8	5.2	3.8	4.4*
Rose	5.4	6.2	5.8	6.6
Daisy	4.2	4.8	3.8	4.8*
Topsy	4.4	5.0	4.4	5.0

* The asterisk denotes that an alteration in the hours of milking was done from 12.30 to 5 p.m., thus accounting for a change in fat percentage and an increase in the quantity of milk. This will be more thoroughly explained later on.

There is a noticeable rise in fat percentage.

Ration 2.—Chaff, 60lbs.; bran, 8lbs.; water, 20lbs.; salt, $\frac{1}{4}$ lb.; or 22lbs. per cow per day, or 11lbs. morning and afternoon.

	Morning per cent. Fat.	Afternoon per cent. Fat.	Morning per cent. Fat.	Afternoon per cent. Fat.
Brindle	3.6	4.6	3.6	4.8
Rose	5.4	6.6	5.4	6.6
Daisy	4.0	4.8	3.8	5.0
Topsy	3.8	5.0	3.8	5.2

There is a fall in fat percentage.

Ration 3 —Chaff, 60lbs.; bran, 16lb.; water, 20lbs.; salt, $\frac{1}{4}$ lb.; or 24lbs. per cow per day, or 12lbs. each meal.

	Morning per cent. Fat.	Afternoon per cent. Fat.	Morning per cent. Fat.	Afternoon per cent. Fat.
Brindle	4.4	5.0	4.2	4.8
Rose	6.0	6.8	6.0	6.8
Daisy	3.7	4.6	3.6	5.0
Topsy	3.8	5.2	4.4	5.4

The additional 2lbs. of bran per cow has shown a considerable increase in fat

Ration 4.—Chaff, 60lbs.; copra, 16lbs.; water, 20lbs.; salt, $\frac{1}{4}$ lb.; or 24lbs. per cow per day, or 12lbs. each meal.

	Morning per cent. Fat.	Afternoon per cent. Fat.	Morning per cent. Fat.	Afternoon per cent. Fat.
Brindle	4.5	5.6	4.8	5.4
Rose	5.8	6.8	6.0	7.0
Daisy	4.0	5.0	3.8	4.4
Topsy	4.8	5.2	4.4	5.8

Again the fat has increased very considerably.

Ration 5.—Chaff, 60lbs.; crushed wheat, 12lbs.; water, 20lbs.; salt, $\frac{1}{4}$ lb.; or 23lbs. per cow per day, or 11 $\frac{1}{2}$ lbs. each meal.

	Morning per cent. Fat.	Afternoon per cent. Fat.	Morning per cent. Fat.	Afternoon per cent. Fat.
Brindle	4.1	4.8	4.4	5.2
Rose	3.4	3.8	3.6	4.1
Daisy	3.8	4.2	3.8	4.8
Topsy	3.8	4.4	4.0	4.8

There is a decided fall in the quality of milk from the above ration, which is without the copra.

It would have been very interesting had we been in a position to have extended the time of feeding to three weeks or a month on one or two particular rations, but this could not be done for reasons explained in the early part of the paper. From those tables the reader will see how the quality has gone up or fallen, according to the extent and stimulating influence and nutritious qualities of the food. It is apparent that the food acts on the mammary glands more quickly than we have been disposed to believe, and although tests showed that the quantity and quality of milk can be maintained for a length of time on one ration, yet I would certainly favor changes in the food stuffs. In

the two latter tests one cannot fail to notice the marked contrast in the morning and afternoon fat readings, more especially in test 3. An explanation of this will be given under the heading of "Morning *versus* Afternoon Milk."

Yield of Milk from the Six Rations.

In giving the quantities of milk I will record the number of pounds in the morning and afternoon milking, with total for each week.

	Morning. Lbs.	Afternoon. Lbs.	Total. Lbs.	Foods in Ration.
Ration A	270	196	466	Chaffed hay and brewers' grains
" 1	268½	203½	472	Chaffed hay and copra
" 2	261½	188½	460	Chaffed hay and bran
" 3	227½	159	386½	Chaffed hay and double quantity of bran
" 4	234½	167	401½	Chaffed hay and double quantity of copra
" 5	279	193	472	Chaffed hay and crushed wheat

The above records bring out the great contrast betwixt the morning and afternoon quantities of milk. Ration 5 has produced the highest number of pounds, and shows an increase of 6lbs. against ration A. This is conclusive evidence that hand-feeding arrests the drying-off of cows, and is the greatest factor in maintaining health and milk flow in the herd during the trying months of the year. Crushed wheat as a food has given good results, but the stimulus may have come from the copra which was contained in the previous ration, to the extent of 4lbs. per cow. The brevity of the tests of individual rations has handicapped us considerably in arriving at reliable evidence on the lasting qualities of the foods. But, without carrying this into effect, we have attained the object at first desired. Crushed wheat might be more extensively used for feeding purposes, as the cost price is reasonable, but care is required in feeding large quantities to cows, owing to the fat-forming properties of the grain. This could be got over as recommended by changing the rations.

Cost of Food Rations and Price Realised for Milk.

As before mentioned, the milk is sold off the farm at an average yearly price of 1s. 2d. per gallon. Let us here consider the cost of feeding the four cows, and the price realised for the milk during the six weeks of feeding.

	Approximate Cost of Weekly Rations for Four Cows £ s. d.	Gallons of Milk— Approximate.	Weekly prices Realised at 1s. 2d. per Gallon. £ s. d.
Ration A	0 11 8	45	2 12 6
" 1	0 12 10	46	2 13 8
" 2	0 11 1	44	2 11 4
" 3	0 13 5	37	2 3 2
" 4	0 15 9	39	2 5 6
" 5	0 12 10	46	2 13 8
Total	£3 17 7	257	14 19 10

In the experiments now concluded it will be clear to the observer that the average quantities of milk given by the cows in tests 2 and 3 are small; but it must be borne in mind that such a circumstance does not interfere with the importance and value of the test, but rather strengthens the merit of the practice. Severe climatic conditions, scarcity of herbage and green fodders, and advanced lactation is a combination that had to be combated, and these have not reduced the results to the extent at first anticipated.

Lessons from the Tests.

Morning *versus* Afternoon Milk.—Amongst farmers it has all along been a subject of concern as to the cause of the increase in quality of milk yielded by a cow in the evening as compared with the morning's supply. The feeding experiments have shown very clearly the difference, not only in quality but

also in quantity, and the striking contrasts in the fat percentages have been exemplified throughout the series of tests. To investigate the reasons for these peculiarities it was thought that much work would require to be accomplished before a definite settlement to the solution could be obtained. Physiological peculiarities and changes in the cow have to be dealt with, but the results of practical observations enable me to put forward a justifiable opinion, and one which coincides with those expressed elsewhere. I have already gone into this subject in test 1, where the opinion held by Professor Dean, of America, is quoted. In returning to this test of the feeding experiments it will be noted that the cows have given milk of equal quality both morning and evening, and the number of pounds yielded at each milking diet correspond. In test 2, again, the evening milk is decidedly richer, and in test 3 the percentage of fat is much higher in the evening's examination, while the quantities in both cases favor the morning supplies. From these experiments there is a cause to be found illustrative of the striking differences, and this can be discerned in the hours selected for milking, system of feeding practised, and general treatment of the cows. That the differences are to be found in the statement embodied in the last sentence I will try to prove, by quoting the average fat percentages and weights of milk from a week's ration taken from each of the three tests, and by giving particulars of the hours of milking, &c.

Percentages of Fat in the Milk of Four Cows during One Week of Feeding.

Test 1—Ration 5.			Test 2—Ration 4.			Test 3—Ration 3.		
Name of Cow.	Morning	Evening	Name of Cow.	Morning.	Evening.	Name of Cow	Morning.	Evening.
Olive	5.2	5.2	Hilly	4.9	5.8	Brindle	4.1	5.1
Bally	5.0	5.0	Duchess ..	3.9	4.6	Rose	6.0	6.8
Daisy	5.2	5.2	Violet ..	4.2	7.2	Daisy	3.9	5.0
Brenda	5.0	5.0	Pansy	5.1	5.3	Topsy	3.9	5.2

Weights of Milk given during the same Week.

Name of Cow.	Morning.	Evening.	Name of Cow	Morning.	Evening.	Name of Cow.	Morning.	Evening.
	lbs.	lbs.		lbs.	lbs.		lbs.	lbs.
Olive	12	12	Hilly	4 $\frac{3}{4}$	3 $\frac{1}{4}$	Brindle	9	6
Bally	10	10	Duchess ..	5 $\frac{1}{2}$	5	Rose	6	4 $\frac{3}{4}$
Daisy	16	16	Violet	7 $\frac{1}{2}$	5	Daisy	8 $\frac{1}{2}$	6
Brenda	15	15	Pansy	7 $\frac{1}{2}$	5 $\frac{1}{2}$	Topsy	9	6

In turning back to tests 1, 2, and 3, readers will find that the even percentage of fat in ration 5 of test 1 was maintained in a continuation of the ration, and, in examining the thirty days of the feeding (which is not published), I find the percentages almost correspond throughout. The same is to be said with relation to the weights of milk. In tests 2 and 3 the fat percentages vary very much; likewise do the morning and afternoon's milk.

Before going further, readers might return to test 1, and peruse what is given by Mr. Wylie, which is a splendid testimony of that gentleman's success in achieving what has been credited to him in this paper.

Hours of Milking, a Chief Factor.

Let us now consider the hours of milking of the cows in the three tests, and there is no reason for disbelieving that we have before us the chief factor influencing the contrasts in the milk yields; and this is well founded when we consider that the cows are usually fed whilst being milked.

The following gives the hours of milking practised on the farms before and during the carrying out of the experiments:—

		Hours, of Milking.	
		Morning.	Afternoon.
Test 1	.....	3.45	3.45
Test 2	.....	7.0	5.0
Test 3	.....	6.30	12.30

The cows in test 1 have been milked at the above corresponding hours for a considerable time, and all through the testing the morning and afternoon results have been practically the same. In test 2 the hours are entirely different, and the tables given on page 950 will show how the percentages of fat and quantities of milk varied. With milking diets more inconsistent in test 3, the fat and daily returns of milk from the cows is still further increased in its irregularity, but as the milk is sold off the farm the milking has to be done at hours to suit the morning and afternoon demands of city customers. To demonstrate that the hours of milking influences the quantity and quality of milk, I will give results of an experiment which was conducted for four days. Had the time been extended for a week or two, more conclusive evidence of the benefits of regular hours would have been obtained.

Two of the cows in test 3, Brindle and Daisy, were milked, along with the others, at the usual hours morning and afternoon. In the following two days both were milked at the same time in the morning, and also at the same hour in the evening, 5:30 (see ration 1). Although dissatisfied with this change, the cows gave milk approaching better regularity.

<i>Two Days before the Change.</i>					
Milking Hour, 5:30 a.m.			Afternoon, 12:30.		
	Per cent Fat	Weight of Milk, lbs.	Per cent. Fat.	Weight of Milk, lbs.	
First day—					
Brindle....	3·8	11½	5·2	8½	
Daisy	4·2	10	4·8	6½	
Second day—					
Brindle....	3·8	10½	4·6	7½	
Daisy	4·0	10	5·0	7	
<i>After Change in Afternoon Milking.</i>					
Morning, 5:30.			Afternoon, 5:30.		
	Per cent. Fat.	Weight of Milk, lbs.	Per cent. Fat.	Weight of Milk, lbs.	
First day—					
Brindle....	4·6	7½	4·4	9	
Daisy	5·0	7	4·4	9	
Second day—					
Brindle....	3·8	10	4·4	10	
Daisy	3·8	9	2·8	9	

Further trials were made with the four cows in test 1, and the experience was very instructive. Bally and Brenda, when bailed up at 1:30 p.m. refused to let their milk down or to eat their rations. The other two cows, Olive and Daisy, gave 5lbs. and 4lbs. of milk, respectively, with 4 per cent. of fat in the former, and 3.4 per cent. in the latter. In the previous afternoon the weights of milk were 12lbs. and 16lbs., and fat readings 5.2 in each case. The following morning milking was done at the usual time, but in the evening the hour was changed from 3:45 to 6 o'clock. At this diet the average loss of milk was 2lbs., and the percentage of fat in the supply from the four cows showed a deficiency of 0.6, 0.8, 0.8, and 0.4.

The results recorded by the last of these changes are somewhat opposed to expectation, but show what follows an alteration in the hours of milking when cows have been long accustomed to regularity in their milking diets. When this is done the animals are taught to yield their milk at a certain time, and a continuation of systematic milking is an education to the cow that excites a sensibility within her to give up her utmost without a grudge, and to maintain both quantity and quality in the milk as long as other conditions remain favorable. Altering the hours of milking, or milking at badly balanced diets, are unfavorable to the activity of the mammary glands and opposed to the natural temperament of cows, hence the teachings of expectancy are not brought into force with the same success as would follow if the hours were regular.

In Dr. Aikman's book of 1899 on "Milk: Its Nature and Composition," the following passage is given—"If, in the case of a cow milked twice a day, the intervening period between each milking is the same, and if other conditions are similar, it may be said that there will be approximately no difference between the morning and evening milk, both as regards quantity and quality. If, on the other hand the times of milking be unequal, it will be found that the milk obtained after the longer interval is greater in quantity, but poorer in quality, than that obtained after the shorter interval." While considering the regularity in the quantity and quality of milk in ration 1, it must be borne in mind that the rations were fed to the cows at milking hours, so that their main bodily support depended on the nutriment given at 3:45 a.m. and 3:45 p.m. This was done in all the tests, which was a repetition of the practices conducted at the farms. Our experiment will differ from those conducted in other countries, whose conditions of climate and food cannot be compared, and I firmly believe that hand-feeding will influence the quality of milk—more so in South Australia, with its scanty herbage, than in other countries where paddock feed is more plentiful. Further consideration will be given to the differences in the composition of milk on page 961; meanwhile we will discuss another reducing factor of the quantity and quality of milk given by cows.

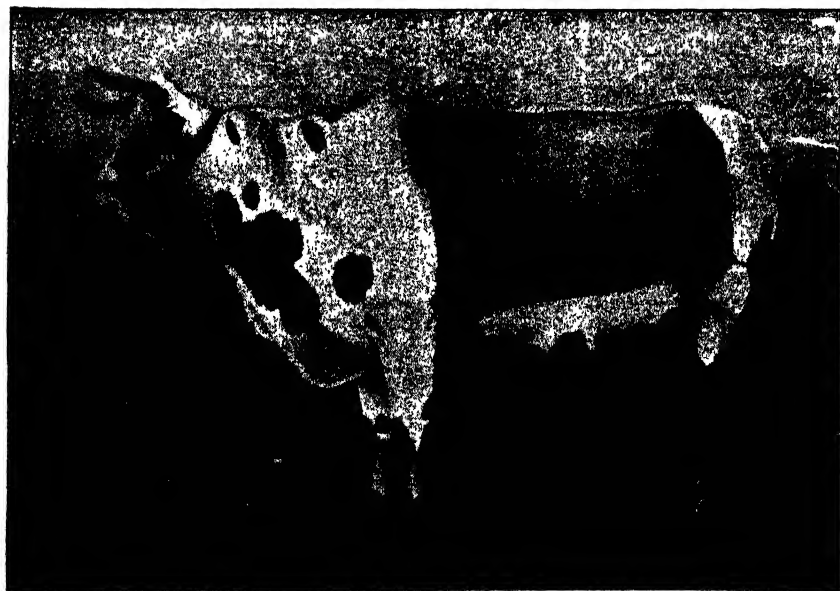
Exposure of Cows to Cold Weather as a Reducing Agent in Milk Production.

Breed of cows and feeding are the great agents in milk production. But there are evils combating the good effect of food and breed of milking stock. Exposure to weather may be cited as one; the other of importance has already been dealt with. Every farmer is thoroughly conversant, from practical experience, with the fact that the milk of cows suffers both in quantity and quality when shelter is not provided for the animals during the cold of winter and the fiery hot days of summer. An illustration of the injury from exposure to cold has already been given in this paper, and I might venture to say that in South Australia large sums of money are lost annually from this cause. More shelter houses and clumps and belts of shelter trees are wanted in the State, and it is to be hoped that closer attention will be given to this question in future. The practice of rugging cows has been suggested in Tasmania, where the climate is certainly cold compared with South Australia, but rugging is already in operation on the farm of Mr. Wyllie, of Kapunda. It may seem a ridiculous thing to do; but, nevertheless, Mr. Wyllie has demonstrated the good results obtained from the system. In the pictures on the following page are seen the No. 1 test group of four cows, with their covers, and a single covered cow. To the ordinary observer, amusement has arisen from Mr. Wyllie's principle of rugging; but we might ask ourselves the question, why rug a horse when it is put out in moderate weather, and neglect to protect the cow in stormy weather? Compared with the average horse, a good cow is on equal terms of cash value; milk is a valuable product, and, above all, the milk-making machinery in the sensitive cow is easily deranged.

I will leave this subject for the farmers to discuss further, but, to emphasise the benefits obtained by Mr. Wyllie, I will give his answers to a few questions on the practice of rugging.

Since rugging your cows, what benefits have you obtained?—Ever since I put covers on my cows there has not been any variation in the quantity and quality of the milk yield. Before I rugged my cows, I have lost as much as 20 galls. of milk and 10 lbs. of butter from the evil effects of one storm, and the cows have suffered to such an extent that extra feeding did not compensate for the injury through exposure. At present these storms have no injurious effects on them, and we never increase the feeding on account of rough weather. It

might interest you to know about the first cow I put a cover on. She was a splendid animal, and had made as much as 17lbs. of butter in a week, and this was off the pan system. Before I purchased this cow she suffered severely from



cold, and would stand under a bush when it was raining and blowing. After being covered, in less than an hour she was out feeding in the rain, and within a week she had increased her produce by one-third, and I reduced her feed by nearly one-half.

Have you observed if covering has made your cows more liable to contract cold or illness?—No; my cows are as healthy a herd as there is in South Australia, and are always in first-class condition. Tubercular disease has not been traced to any for the past four years.

Other Conditions Influencing the Quantity and Quality of Milk.

We have the individuality of the cow, and careful and thoughtful dairy farmers study the individuality of their animals to a profitable degree. Some cows are more nervous than others, therefore they require increased consideration to avoid interference with the activity of the glands in the udder; also, health, period of lactation, and age are considered amongst the other causes.

Variations in the Fat Percentage of Milk Secreted.

Various theories have been put forward to explain the probable causes influencing the changes in the quality of a cow's milk at different stages of milking. In treating this subject, Dr. Aikman, in his book, gives the following reasons:—

The amount of milk yielded by the cow depends on the activity of the milk glands in the udder, and this in its turn is influenced by a number of conditions. For one thing, it seems to be dependent on the amount of milk the udder contains. Thus, so long as the udder is comparatively empty, and other circumstances are favorable, the secretion of milk by the milk glands seems to take place unhindered. But whenever the udder becomes full of milk, the rate at which the secretion goes on is diminished. It still goes on, however, as is evidenced by the distension of the udder which takes place under such circumstances, but it is no longer at the normal rate. The pressure to which the udder is subjected seems to affect the nature of the secretion—the quality of the milk secreted being different. Now, what has been above stated seems to throw much light on the interesting and well-known fact that, if a cow which has been in the habit of being milked twice a day is milked oftener, the result is not only that more milk but milk of richer quality is obtained than was formerly the case. But when the secretion of milk is forced to go on under pressure, not merely is the quantity of the milk lessened, but owing to this pressure more frictional resistance is offered to the passage of the fat globules and the rest of the solids of the milk through the secreting vessels and ducts in the udder. It is for this reason that milk secreted under pressure is poorer in quality. The above facts also explain another interesting phenomenon familiar to all interested in dairying, viz., that the milk which is first drawn when the cow is being milked is invariably poorer in quality than that last drawn—the so-called strippings, which, it is well known, are always very rich in quality.

Experiments to Ascertain the Fat Variations in Milk.

In order to show actual results, arrangements were made at three factories to conduct fourteen day-tests of the milk from one cow. The instructions given required the butter fat testing morning and evening of the first, middle, and last week, and also the percentages of acid in these samples when first drawn, and until the acidity had developed beyond 0.3 per cent. Equal quantities of milk were taken from day to day, and every possible care was taken to avoid interference with the accuracy of the collections and the testing. Creamometer percentages were also recorded, and the value of the experiment adds further to the good results of hand-feeding. At one of the three factories the test was made for one month, but it will only be necessary to give the results of the first fourteen days.

The Test.

At this factory the test cow was taken from amongst a herd grazing in a paddock some distance away, where a good supply of herbage was at her command, but no hand-feeding was practised.

For convenience of testing, the cow was put into a yard adjoining the factory, and her food for the first four days consisted of chaffed hay, while bran was added in the rations to follow. Abundance of water was supplied to her daily, and to all appearance the cow took kindly to the change, no difficulty being found in the operation of milking, and no shrinkage in her usual supply. With

these favorable conditions testing began on the morning of the third day from the date of enclosure of the cow, and continued without intermission until the expiry of the first fortnight, when the animal was removed to her old quarters for a few days, and thence taken back to conclude the remaining fourteen days. The results obtained during the last fourteen days corresponded with the first half of the experiment, so that the tables of tests to follow may be safely relied upon.

The hours of milking were at 7-30 in the morning and 5-30 in the evening. The figures furnished in the tests from the other factories strengthen the accuracy of the tables in this experiment.

The following gives the creamometer readings and the fat yielded during the hay-feeding, omitting the first two days:—

Chaffed Hay Feeding.

Date of Test.	Creamometer Readings.			Fat Tests.			
	First Milk. Per cent.	Middle Milk. Per cent.	Strippings. Per cent.	First Milk. Per cent.	Middle Milk. Per cent.	Strippings Per cent.	
March 18 {	..... 2	7	10	1.3	2.6	4.4	Morning
	..... 3	8	12	2.8	5.0	6.8	Evening
" 19 {	..... 2	7	11	1.4	3.5	8.2	Morning
	..... 3	9	13	2.6	5.1	6.4	Evening
" 20 {	..... 2	7	12	1.6	3.8	6.3	Morning
	..... 3	8	13	2.7	4.6	6.3	Evening
" 21 {	..... 1.5	11	15	1.2	3.9	7.8	Morning
	..... 3	10	13	2.8	5.0	6.3	Evening

Observe the high percentages of fat in the first and middle drawn milk of the evening, and the low percentages of fat in the strippings. The strippings of the creamometer tests are somewhat opposed, but this can be accounted for by the increased percentage of cream becoming checked in its ascent to the surface by the viscosity of the milk.

Chaffed Hay and Bran Feeding.

Date of Test.	Creamometer Readings.			Fat Readings.			
	First Milk. Per cent.	Middle Milk. Per cent.	Strippings. Per cent.	First Milk. Per cent.	Middle Milk. Per cent.	Strippings. Per cent.	
March 23 {	..... 2	9	14	1.5	3.8	7.8	Morning
	..... 3	11	16	2.7	5.2	6.0	Evening
" 23 {	..... 2	10	14	1.0	4.8	10.2	Morning
	..... 2	11	16	2.5	4.6	8.0	Evening
" 24 {	..... 2	11	16	1.6	3.7	7.6	Morning
	..... 2	10	15	2.7	4.3	6.1	Evening
" 25 {	..... 1	11	16	1.0	3.4	10.0	Morning
	..... 2	12	17	2.6	5.0	8.2	Evening
" 26 {	..... 2	11	18	1.3	4.0	10.0	Morning
	..... 3	13	16	2.8	5.2	7.3	Evening
" 27 {	..... 2	12	15	1.4	4.8	7.8	Morning
	..... 3	12	16	2.7	4.8	7.3	Evening
" 28 {	..... 2	10	17	1.2	4.5	9.2	Morning
	..... 3	12	16	2.1	4.8	8.0	Evening
" 29 {	..... 1.5	12	18	1.7	4.4	9.2	Morning
	..... 3	12	17	2.0	6.0	8.0	Evening
" 30 {	..... 2	12	16	1.8	4.7	9.1	Morning
	..... 2.5	11	17	2.2	4.8	7.9	Evening
" 31 {	..... 1	10	19	1.0	4.0	10.0	Morning
	..... 2	11	16	2.2	4.8	7.8	Evening

The increase in milk was fully 1qt. per day compared with the first milking.

First Milk versus Strippings.

It is noticeable that the first-drawn milk is very poor in fat constituents, the middle higher, and the strippings very rich. From the above test an average of 1.8 might be taken from the first milk, 4.3 for the middle, and 8 per cent.

for the strippings. In individual animals the percentages would certainly vary; but, in drawing a comparison with other tests made, the figures already given are consistent.

Much significance has been put upon the necessity for efficient milking, and care has been taken to make it clear to dairymen. That injurious influences follow negligence in efficient stripping, permit this test to afford conclusive evidence of the extremes in quality of a cow's milk, and the vital importance attached to the duty of the milker.

Food and Milk.

In comparing the effects of the two feeds on the quality of the milk, it is clearly illustrated that a marked improvement has followed the change in ration. Throughout the experiment the first-drawn milk has not altered to an appreciable extent, the middle milk is practically the same; but in the case of the strippings there is a marked contrast, the latter feeding giving a much higher quality than the hay alone. In glancing over the figures, readers might take note of the greater regularity of the readings which have followed the pursuance of the experiment.

An Important Feature of the Test.

The most important feature of the fat experiment is embodied in the singularity of the first and middle milking being highest in butterfat in the evening, while the strippings are quite the reverse. This peculiarity has been confirmed in the other tests made. The percentage of fat in the bulk samples, however, favored the evening's supply, which can be attributed to the strippings which comprise such a small quantity of the yield, and the first and middle milk show a better quality against the morning supply. This was exemplified in test made with 4oz. sample of first, middle, and last quantities of milk from a control cow which was kept under observation for sixteen days. The average percentage of fat in the morning was 4.1, and in the evening it showed 4.3, while the morning strippings gave an average of 6.2, against 5.8 in the evening.

With a view to determine the variation in the yield of solids, and to justify the fat tests, one day's analyses was made of the first and middle milk, and strippings of both the morning and evening's milking. One of the test cows in No. 1 feeding experiment was selected, and the analyses given will illustrate how close the morning and evening percentages were, but the fat readings favor the peculiarities already referred to.

Analyses of Evenings' Milk.

	Water.	Fat.	Total Solids.	Solids not Fat.	Specific Gravity.
First milk	86.35	2.2	13.64	11.44	10.37
Middle milk	83.38	5.5	16.63	11.13	10.33
Strippings	79.76	9.6	20.23	10.63	10.27

Analyses of Mornings' Milk

	Water.	Fat.	Total Solids.	Solids not Fat.	Specific Gravity.
First milk	87.63	2.0	12.37	10.37	10.36
Middle milk	83.31	6.3	16.69	11.39	10.31
Strippings	79.76	8.4	20.25	11.85	10.27

Acidity Tests and Milk Losses.

The losses to the industry of dairying through acidity of milk assumes alarming proportions every summer. A yearly reduction could be made in the monetary loss if the dairy farmer would expend a little time and trouble to retain a sweet condition in his milk supply. Want of perseverance, and a reluctance to adopt improved methods, is still present in the minds of many dairymen. Simple devices could be adopted with good results, and milk would remain sweet for hours longer in the heat of summer. Illustrations of the

beneficial effects of protecting milk and cream cans with wet covers during hot nights, and whilst they are in transit to the factory, have already been given in the *Journal*. We are striving to increase the quality of our butter and cheese, and success is following our instructions; but better evidence of advancement would be felt if we had the combined efforts of the dairy farmers, factory directors, and promoters. I have already pointed out the existence of rivalry amongst factories, and the disastrous results that follow the acceptance of sour and contaminated milk. As long as this state of affairs is permitted to exist, suppliers will be discouraged in their endeavors to uphold the reputation of their respective factories.

At the commencement of the feeding trials it was stated that acidity experiments were being conducted. The results of the three elaborate tests are of equal importance. I need only quote the readings from the first three milkings, as extracted from the Wilmington factory records. It may be well to explain that these acidity determinations were made for one month at the above factory.

In taking the samples, equal quantities were milked from the cow into sterilised vessels of similar shape and capacity, and acid tests were immediately taken. The samples were kept under exactly the same conditions, and the readings were noted down from each quantity of milk examined at the same hour.

It will be seen that the first milk is higher in percentage of acid, and the last tests show that the acidity has increased against the middle milk, while the strippings have kept a shade better than the middle sample.

Acid Determination of a Cow's Milk.

Milking.		Acid Readings taken.		Duct Washings.		Middle Milk.		Strippings.	
Date.	Hour.	Date.	Hour.	Acid.	Remarks.	Acid.	Remarks.	Acid.	Remarks.
Morning Milk.									
Mar. 18	8 20 a.m.	Mar. 18	8:30 a.m.	0.20	—	0.19	—	0.19	—
			11:30 a.m.	0.21	—	0.19	—	0.19	—
			5:0 p.m.	0.22	—	0.20	—	0.20	—
		Mar. 19	11:45 a.m.	0.26	—	0.23	—	0.22	—
			3:10 p.m.	0.28	—	0.24	—	0.24	—
			6:5 p.m.	0.34	Partly thick	0.30	—	0.29	—
		Mar. 20	7:30 a.m.	0.38	Thick	0.34	Thin	0.33	Thin
Evening Milk.									
Mar. 18	5:20 p.m.	Mar. 18	5:30 p.m.	0.20	—	0.19	—	0.19	—
			6:30 a.m.	0.22	—	0.21	—	0.21	—
			11:30 a.m.	0.24	—	0.22	—	0.22	—
			6:10 p.m.	0.23	—	0.25	—	0.24	—
			10:40 a.m.	0.37	Thick	0.34	Thin	0.33	Thin
Morning Milk.									
Mar. 19	9:20 a.m.	Mar. 19	8:30 a.m.	0.20	—	0.19	—	0.19	—
			11:30 a.m.	0.22	—	0.20	—	0.19	—
			5:35 p.m.	0.25	—	0.23	—	0.22	—
		Mar. 20	9:0 a.m.	0.27	—	0.26	—	0.24	—
			12:5 p.m.	0.31	—	0.27	—	0.26	—
			2:15 p.m.	0.34	Thick	0.3	—	0.29	—
			5:0 p.m.	0.39	Thick	0.35	Thin	0.34	Thin

Plate 1. — From duct washings, showing numerous colonies of organisms.

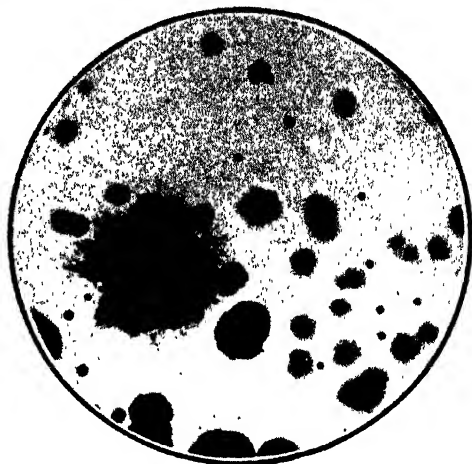


Plate 2. — From middle milk, showing few colonies.

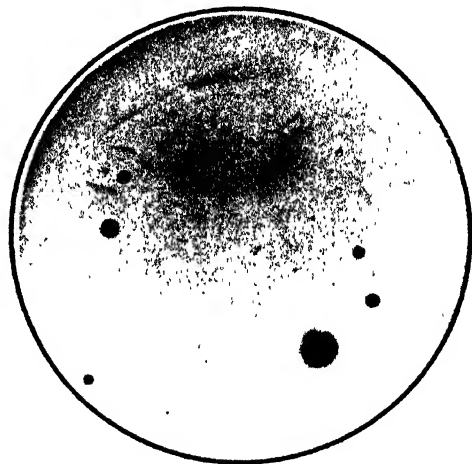
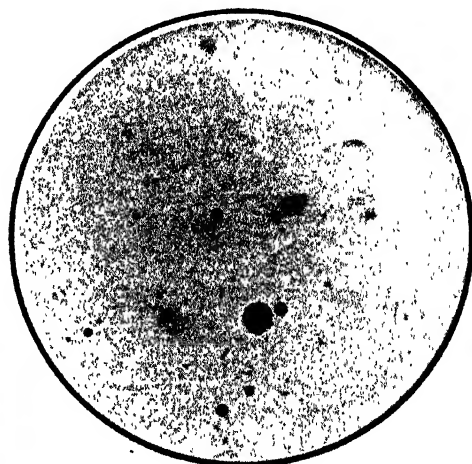


Plate 3. — From strip-pings, showing few colonies.



For comparison we will take a few others, giving the first and last readings and omitting the intermediate tests.

	Duct Washing.	Middle Milk.	Strippings.
First test	0.21	0.19	0.19
Last test	0.40	0.35	0.34
First test	0.19	0.18	0.18
Last test	0.40	0.30	0.34
First milk	0.20	0.19	0.19
Last milk	0.40	0.35	0.34
First milk	0.19	0.18	0.18
Last milk	0.37	0.34	0.33
First milk	0.20	0.19	0.19
Last milk	0.38	0.34	0.33

The average for the duct washing may be taken at 0.20 per cent. acid, middle milk 0.19, and strippings 0.19.

Bacteriological Cultivation.

The plate cultures show colonies of organisms grown from one drop of milk after two days' cultivation, at 90° F.

The samples of milk collected for bacteriological testing were carefully taken, both the tubes and cotton wool being sterilised, but no precautions were observed to have the udder and flanks of the cow clean. This serious neglect would account for organisms finding their way into the milk throughout the entire process of milking. Few people take the trouble to do this simple duty, and I would strongly recommend dairy farmers to adopt the practice and persist in having it carried out in a satisfactory manner. In plate cultures 2 and 3 a number of colonies are seen, and there is no doubt that a few of those invaders obtained admittance from the external parts of the teats, as the ducts must have been well washed out before the strippings were removed.

In consideration of this subject I might refer readers to last month's *Journal*, where an article is given entitled "How Choice Butter was Manufactured," and I am pleased to relate that the butter was made from the milk of cows that had their vessels and flanks thoroughly cleansed before milking.

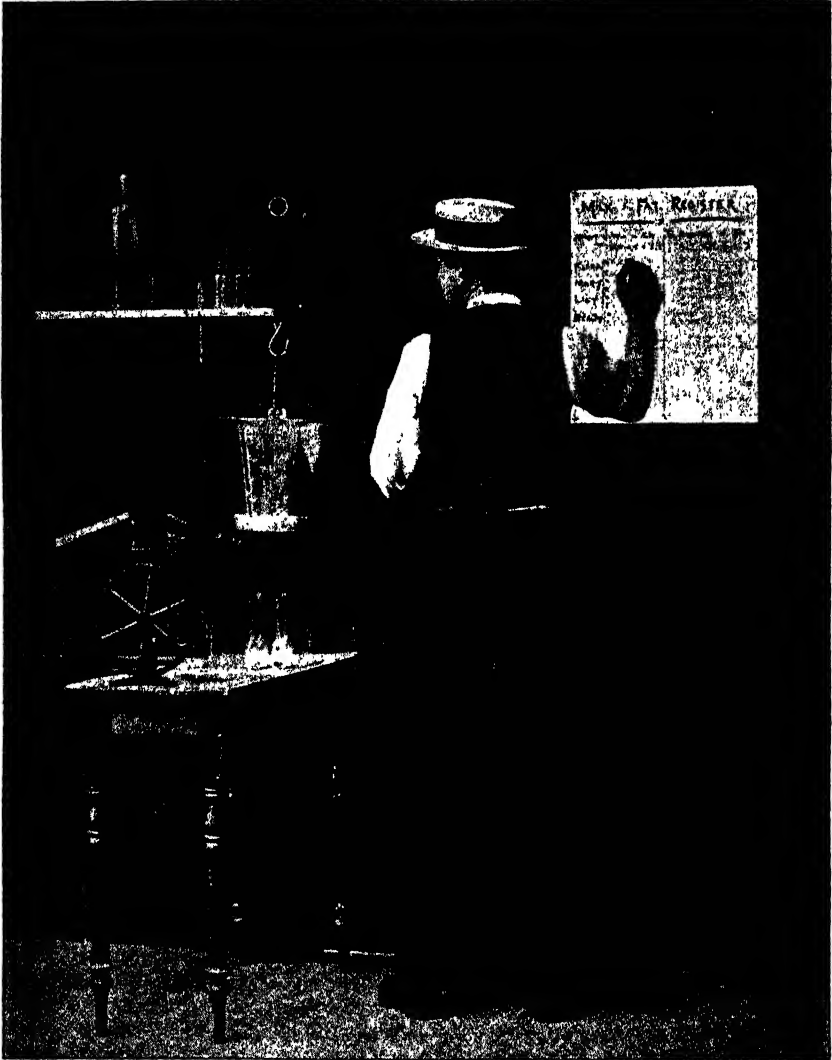
Grading a Herd.

The Value of the Farmers' Babcock Tester and Weighing Balance.

The usefulness of the Babcock test on the farm has been established in the foregoing experiment; also the weighing balance claims a place amongst the necessary appliances of the dairy. Equipped with this valuable apparatus, the farmer can, at a trivial cost, determine the capabilities of each cow, and by a little care and tact he can grade his herd to a class of creditable milkers. Obscure ideas of the merits and demerits of foods given would no longer exist in the minds of the doubtful, as experiments could be conducted to ascertain the relative values of the rations given, and great would be the profits if the Babcock and the balance were put into universal use throughout the dairies of the State. In commending the Babcock test to farmers, I must point out, however, that it would not be good policy on their part to attempt to dispute the accuracy of milking tests with factory managers; and I would advise those who purchase testers to employ them exclusively in the uses shown in this article.

In the next illustration the spring balance is shown suspended from the wall support, and the operator is seen recording the weights of milk in a register. The four-bottle Babcock machine and flasks containing milk are seen on the table, and on the shelf to be found the acid, additional flasks, and pipettes. The simplicity of the practice enables anyone to carry it out to complete satisfaction in grading milking stock, and readers will understand the good influence this introduction to modern dairying will exert on the future milking cow and

the success of the farm. The following may be taken as an example:— Where weighing milk from each cow has been practised and systematic dairying conducted, a dairy farmer in this State possesses a very fine herd of milking stock; he began dairying with one cow, and in 1893 he owned four cows which yielded an average of 450galls. of milk for the year. In 1896 his herd increased to eighteen cows, and the record was 547½galls. to each cow. In 1897 the average



for twenty cows was 720galls., and in the year 1900 twenty-five cows averaged 800galls. The quantity of milk did not rise at the cost of quality, as the percentage of fat in the milk of the twenty-five cows had never fallen below 4 per cent., and in a number of cases had exceeded 5 per cent

In conclusion, I will give a milk and butter fat register, showing actual results from cows in tests 1 and 3. In testing the qualities of food rations the

8. Copra cake in a ration is highly recommended, but it must be given sparingly to begin with, otherwise cows will take objection to it. Commence with quarter of a pound in a ration and increase to two pounds daily.

9. Cream from copra fed cows requires a higher temperature to churn, butter grains are firmer and collect thoroughly, and the melting point of butter is higher.

10. Heavy feeding with copra is against the texture and flavor of butter; feeding in a ration with bran gives best results.

11. Changing rations every week or fortnight gives the greatest profit and is beneficial to the health of cows. Green feed daily is a decided improvement.

12. Breed and feeding are responsible factors in milk production, but there are others of much importance, and which are invariably overlooked, viz.:—regularity in milking, efficient stripping, and protection of cows from cold and wet weather.

13. The first milk from a good cow will contain about 2 per cent. of fat, the middle milk 4, and the strippings 8 per cent. of fat.

14. Grade the milking herd by using the spring balance and Babcock tester.

MANURE-VENDORS' CIRCULARS.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

My attention has been directed to the fact that in certain circulars issued by manure importers reports and articles written by myself are being used to advertise certain brands of fertilisers to the disadvantage of other makes. The circulars in question in some cases quote only portions of my remarks and connect them with the brand of fertiliser to its advertisement. In other cases additions have been made to my reports which, in my opinion, are calculated at first glance to credit me certain statements that I have not made, and which are not correct. This being the case I wish to point out to purchasers of fertilisers that I absolutely disclaim any responsibility for the correctness of these statements, or for the inferences that may be drawn therefrom. No firm has any authority to make use of my reports in this way, though there can of course be no objection to the use of articles from this journal, so long as they are reprinted exactly as published, without any addition, and care is also taken that any inferences drawn from such articles are printed in such manner as will make it clear that I am not in any way responsible for them.

I would again point out to farmers the necessity for accepting with considerable caution any statements concerning manures that the agents are not prepared to guarantee. It is not sufficient for the agent to be able to say that "Last season the Inspector's analyses showed our manure to contain so much water-soluble phosphate and so much moisture." Unless he is prepared to guarantee that the supplies this year will be of the same quality these figures only show that the particular brand has proved reliable in the past. I cannot too strongly emphasise the fact that the merchants are only bound to deliver manure up to the *minimum* amount of their guarantees, and if the guarantee says nothing as to the condition of the bags and the moisture content the purchaser has no hold on the seller as regards these points.

Then, again, any statement that because a single sample of one brand has been found to contain a much lower percentage of moisture than another it is a proof that the merchant selling that particular brand supplies more of the fertilising constituent to the ton than sellers of other makes is absolutely unjustified. The difference in the moisture may simply correspond with the difference between the percentage of gypsum or other matter in the different brands. Proof of this is

afforded by the fact that during the present year one sample of mineral super. tested at the School of Mines was found to contain 36·5 *per cent. water-soluble phosphate*, and 5·6 *per cent. only of moisture*, whereas another sample, which contained 40·3 *per cent. water-soluble phosphate*, contained 6·08 *per cent. of moisture*. Other tests show 28·9 *per cent. water-soluble phosphate*, 8·2 *per cent. moisture*; 38·68 *per cent. water-soluble phosphate*, 8 *per cent. moisture*; 36·70 *per cent. water-soluble phosphate*, 5 *per cent. moisture*. No stronger evidence can be desired of the fallacy of the claim that has been made that because one brand may contain 8 *per cent. to 9 per cent. less moisture* than another purchasers of it will obtain 2cwts. *per ton more of the fertilising ingredient*. Nor can these figures be taken as proof that a moist or sticky super is better than a dry super. The analysis of the percentage of water-soluble phosphate is the only reliable evidence of the quality of the manure, though dryness is, of course, desirable.

USE OF FERTILISERS IN SOUTH AUSTRALIA.

BY W. L. SUMMERS, INSPECTOR OF FERTILISERS.

Seeding operations for the present year being practically ended, I propose to give a few particulars concerning the use of commercial fertilisers for the wheat crops of South Australia. The use of these fertilisers is practically in its infancy, as prior to 1897 only a few hundred tons annually were used by our farmers. Since then, however, their use has rapidly increased.

With a view to securing reliable information concerning the tonnage and value of these fertilisers, I have, during the past few years, kept careful records of all importations, and have obtained from the principal local manufacturers particulars of their outturn. In 1899 about 12,500 tons of imported and 4,000 tons of locally-manufactured fertilisers, or a total of 16,500 tons, were used for manuring the South Australian wheat crop. In 1900 the figures were—imported, 21,200 tons; local, 3,400 tons; total, 24,600 tons. This year I estimate the amounts as follows:—Imported manures, 26,400 tons; local, 5,000 tons; total, 31,400 tons.

In dealing with the imported fertilisers I take the imports from December 1st to May 31st, as little, if any, arrives before the first date, and any coming after the latter date has little chance of being used for wheat during the current season. In placing the tonnage of imported manure at 26,400 tons I have taken credit for stocks, mostly Thomas phosphate, carried over from previous season, and allowed for re-exports and stocks in hand. The value of this, at current market rates, is £108,000.

The local output is this year somewhat higher than last season, due to the Adelaide Chemical Works having commenced the manufacture of mineral superphosphate at Thebarton and Port Adelaide. Three or four years ago the output of South Australian manures was somewhat larger, considerable quantities of high-grade native guano being sold; but during the past two years these have been conspicuous by their absence, owing to the best deposits being worked out. A number of farmers on the west coast use considerable quantities of guano, which they collect from the neighboring islands, and a few tons are still brought to Adelaide. The demand, however, for superphosphates seems to check the use of any but high-grade guano in its natural condition. The local output consists, approximately, of the following:—

	Tons.
Bonedust and bone manures.....	1,000
Supers. and mixed fertilisers.....	4,700
Guano	300
Total	6,000

This total of 6,000 tons includes a certain amount of imported fertilisers used by manufacturers, and bonedust, bone super., &c ; used by gardeners and orchardists, say 1,000 tons in all.

We may therefore take the following figures as a fairly accurate statement of the quantities of fertilisers used for the 1901 wheat crop :—

	Tons.	Value.
Imported fertilisers	26,400	£108,000
Local fertilisers	5,000	22,000
Totals	31,400	£130,000

The value is the actual cost price to the purchasers, and will not therefore agree with the values given in the Customs returns. In addition to the purchase price of the fertilisers the farmer has to pay rail, road, or boat carriage from Port Adelaide. Careful inquiry from the principal dealers shows that this will average about 7s 6d. per ton, or, on the 31,400 tons, an outlay of £11,775; a total cost for manures for one season's wheat crop of £141,775.

The great majority of our farmers use less than 100lbs. of manure per acre, and comparatively few use more than 1cwt. If each ton of fertiliser is, however, applied to only twenty acres, we have an area of 628,000 acres. This estimate is, I am confident, very considerably within the mark. The following figures show the marked increase in the area of manured wheat crops during the past five years :—

1897— Estimated area manured	60,000 acres
1898 “ “	250,000 “
1899 “ “	400,000 “
1900 “ “	500,000 “
1901 “ “	628,000 “

With wheat at 2s. 6d per bushel on the farm, it will require at least 4bush. per acre to return a profit on the outlay for manures and the expenses attendant on putting in the crop by means of the seed-drill, or a total increase necessary of over 2,500,000bush. The fact that the practice of using fertilisers is extending so rapidly is in itself the best proof that it is profitable.

It may be of interest to readers to know whence this large quantity of fertiliser comes, and of what it consists. The total of 31,400 tons is made up, approximately, as follows :—

	Tons.
Mineral superphosphate	25,500
Bone and guano supers.	2,700
Thomas phosphate.....	1,600
Bonedust and other fertilisers	1,600

Of the imported fertilisers Great Britain supplies about 21,500 tons; Germany, 2,500 tons; New South Wales, 1,300 tons; and Victoria, 500 tons. Except in bone and bone manures, the South Australian farmer does not apply nitrogen to his crops, our soil and climatic conditions being responsible for this reversing of European practice. So far phosphatic manures only have given a profit. As will be seen from the above figures the great demand is for soluble phosphate.

At the close of last year Parliament passed a new Fertilisers Act, to regulate dealings in commercial fertilisers. Previous legislation was repealed and extended powers obtained by the department. The new Act has had a very satisfactory result in many ways. Fifty-seven brands of fertilisers were registered, in accordance with the Act, several low grades of bonedust and other local makes, which were sold previously, having been withdrawn from the market.

During the season every effort has been made to keep a strict check on the fertilisers sold in this State. From December to May thirty-six oversea ships,

with sixty different shipments of fertilisers arrived. Of these, all but three ships and six lots of manure were visited, and samples taken for analysis. Forty-seven samples of local makes were also taken besides about ten lots from the neighboring States. The results of the analyses of these samples were published in the June issue of the *Journal of Agriculture*. These analyses revealed a very satisfactory state of affairs, only four out of nearly 120 samples showing a deficiency of more than 2 per cent. of tricalcic phosphate.

THE USE OF PHOSPHATES IN EUROPE.

Of the various materials known as chemical fertilisers or artificial manures none has advanced so rapidly in the European farmer's favor in recent years as basic slag, or Thomas phosphate powder, as it is termed on the Continent. It is a by-product of the manufacture of steel by the Thomas-Gilchrist process, which was introduced in 1879. At the outset the material as it came from the Bessemer converters was allowed to accumulate as mere rubbish, and it was not till towards the middle of the eighties that its value as a source of phosphorus for cultivated plants began to be recognised. In 1880 the production of the *scories de phosphoration* in the Grand Duchy of Luxemburg and in Germany was only 4,326 tons, in 1890 it was 358,320 tons, and in 1899 it had risen to 953,570 tons. The production of basic slag in Europe now exceeds 1,700,000 tons annually, and its contents of phosphorus represents about half of the world's agricultural consumption of this element in the form of superphosphate of lime. The latest year for which full statistics of the production and consumption of basic slag are available is 1889, for which period M. Grandeau has brought the details together in the *Journal d'Agriculture Pratique*. The countries of largest annual consumption are Germany, 895,500 tons; France, 170,000 tons; Great Britain, 128,000 tons; Austria-Hungary, 92,000 tons; Belgium, 89,000 tons; Sweden, 58,000 tons; and Italy, 56,500 tons. The countries of the greatest annual production, as measured by the output of 1899, are Germany, 1,009,000 tons; Great Britain, 267,000 tons; France, 166,000 tons; Belgium, 131,000 tons; and Austria-Hungary, 63,000 tons. Great Britain is the only country in Europe in which the production largely exceeds the consumption, more than half the total output in 1899 having been exported to different countries, headed by Germany, which took 34,000 tons, and France, which took 30,000 tons. It is since 1893 that the manurial application of basic slag has so largely increased, and in 1899 the consumption in Europe exceeded by 13 per cent. that of the preceding year. In addition to mineral superphosphates and basic slag other phosphate compounds—mineral phosphates, ground bones, guano, bone superphosphate, for example—are used on a considerable scale as fertilisers. The calculated quantity of phosphoric acid applied in the forms named during the season 1899-1900, given in English weights, is shown in the following table:—

Country.	Basic Slag	Mineral Super.	Other Phosphates	Total.
	Tons.	Tons.	Tons	Tons.
Germany	139,932	118,351	30,271	288,554
France	24,900	143,645	55,660	224,205
Great Britain	17,479	73,432	4,294	95,205
Austria-Hungary	15,112	28,123	8,985	52,220
Totals	197,423	363,551	99,210	660,184

The tonnage given is of phosphoric acid; the actual amount of fertilisers used would be from six to ten times the total given. No notice is taken of the phosphoric acid returned to the soil in farmyard manure

NITRATE OF SODA FOR MARKET GARDEN CROPS.

By W. L. SUMMERS, INSPECTOR OF FERTILISERS.

Although immense quantities of nitrate of soda are used in Europe and America, especially for market garden crops, very little is used in this State, the total importations only reaching a few tons annually, the larger portion of which is probably used for manufacturing purposes. This is undoubtedly due partly to a belief that nitrate of soda is an "exhausting" manure, partly to ignorance of the proper functions of nitrate, and also to the popularity of sulphate of ammonia, which is manufactured locally.

In reference to the alleged exhausting effects of nitrate of soda Dr. Bernard Dyer, F.C.S., F.L.S., one of the foremost authorities in Great Britain on agricultural chemistry, says—

It has long been cried down as a mere stimulant—a manure which acted on the crop as a whip, but did not feed it. No more erroneous idea has ever been propagated, and yet it still obtains far and wide over the country. Nitrate of soda supplies plant food of the most concentrated and direct kind, and its action is wholly a feeding and not a stimulating one. It is true that it contains only one essential element of plant food, namely nitrogen, and therefore it cannot be expected to do alone the work of nourishing a crop that requires also mineral food, any more than starch alone will nourish an animal. For nitrate of soda to produce its proper effects either the soil must be in good condition, maintained by the plentiful use of dung, or other artificial must be supplied to supplement it. Without these conditions it will not produce a healthy increase.

Referring to the fact that many growers, while condemning nitrate of soda as exhausting, favor the use of sulphate of ammonia, Dr. Dyer says:—

As a matter of fact there is no difference whatever in the action of the two manures, except that one acts more rapidly in dry weather than does the other. Sulphate of ammonia is turned into nitrate in the soil, and as regards their feeding and exhausting value there is no difference between them. Nitrate of soda is the more soluble manure of the two, and its action when used as a top dressing upon crops that require to be kept growing is most marked.

Some prejudice against the use of nitrate of soda has arisen from its improper use. Rank growth is a frequent complaint. This, however, is due to giving too much of the manure at one time, and will occur with any other readily soluble fertiliser. To obtain the best and most profitable results it should be given in two or more dressings during the growth of the plant. One dressing of 2cwts. per acre will be of much less value than the same quantity given in two or three dressings. This is due not only to the fact that the lighter dressings at intervals supply the plants with food when they are best able to make the most use of it, but also to the fact that the nitrate, being easily soluble in water, the application of heavy dressings must result in a portion at least being carried away in the drainage waters.

Nearly all of our market gardeners depend very largely upon the manure they obtain from various stables in the city. Were they to have the stuff analysed, and compare the analysis with what the manure has cost them by the time they spread it upon the land, they would doubtless be surprised at the high price they are paying for the fertilising constituents contained therein. One ton of good fresh farmyard manure will contain on the average about—

12lbs. nitrogen
10lbs. potash
7lbs. phosphoric acid.

It is very doubtful, however, whether the mixture of straw, seaweed, dung, etc., usually obtained in Adelaide contains half this quantity. Taking it at its best these ingredients could be purchased in commercial fertilisers at a cost of from 10s. to 12s. 6d. It is not suggested for one moment that commercial fertilisers should replace farmyard or stable manure for market garden crops, but that they should supplement it. Apart from its fertilising constituents

stable manure has a distinct value in its mechanical action on the soil, and in that the decaying vegetable matter adds humus to the soil. Humus is most valuable because it largely increases the power of the soil to absorb and retain moisture, and enables the plants to make better use of the food therein.

Sulphate of ammonia is at present used to a considerable extent by gardeners in this State, and at present prices—a pound of nitrogen in sulphate of ammonia costs about 7½d., and in nitrate of soda about 8½d., so that the former is the cheaper. If, however, as is the case in other parts of the world, nitrate of soda will give a better return, the difference in price is hardly worth taking into consideration—112lbs. nitrate of soda, costing 13s., will supply as much nitrogen as 90lbs. sulphate of ammonia, costing 11s. An extra outlay of 2s. to 3s. per acre on market garden crops is a very small item.

With a view to obtaining reliable data in respect to the effect of the addition of nitrate of soda to land manured with dung and phosphates, Dr. Dyer, in conjunction with Mr. F. W. E. Shrivell, F.L.S., of near Hadlow, in Kent, has carried on experiments with various crops since 1893. The land used was ordinary clay loam, only sufficiently manured in the past to enable it to bear fair crops in ordinary rotation. In the series of tests one plot received 12½ tons of dung per acre, another 50 tons of dung, and three others with 12½ tons of dung and 1cwt., 2cwts., and 4cwts. nitrate of soda respectively, besides phosphate, and the sixth plot 4cwts. of nitrate of soda with phosphates alone. The quantity of phosphate varied—the first year 8cwts. per acre of a mixture of super. and Thomas phosphate; the second year, 4cwts. super.; the third, 6cwts. super.; and the fourth, 7cwts. Thomas phosphate. Half of each plot receiving commercial fertilisers was also manured with potash. A summary of the results of the experiment is given in the following table, the average for the whole period being given, and the return from 12½ tons of dung per acre taken as a standard for comparison of results:—

Nature of Crop.	Average Return per Acre from Standard Plots.	Increase per Acre resulting from—				Average Return from Plots Manured with Artificiala only.
		12½ tons Dung Extra.	1cwt. Nitrate of Soda and Artificiala.	2cwts. Nitrate of Soda and Artificiala.	4cwts. Nitrate of Soda and Artificiala.	
	tons.	tons.	tons.	tons.	tons.	tons.
Cabbages—Imperial	23½	2½	5½	4½	6½	27½
Savoy	12½	2½	3	4½	5½	16½
Autumn planted ..	15½	—	½	1½	1	18½
Summer Lettuces	15½	3½	3½	3½	3½	17½
Winter Lettuces	12	3½	2½	3½	3	13
Rhubarb—Small varieties	5½	4	4½	6½	4½	10
Victoria	20	7½	1½	1½	10½	34½
Carrots	13	1½	1½	5½	4½	16½
Spinach	4½	½	1	1½	2½	4½
Potatoes—Main crop ..	7½	1½	1	1½	2½	7½
Early	6½	1½	½	1½	1½	5½
Cost of manure	£5	£10	£6 10s.	17	£7 10s.	£2 10s.

Cauliflowers—In the tests with these the average weight per head was taken, instead of the return in tons. The returns were as follows:—Standard plot, 3lbs. 7ozs.; double duning, 4lbs. 8ozs.; addition of 1cwt. nitrate, 4lbs 2ozs.; 2cwts. nitrate, 4lbs. 5ozs.; 4cwts. nitrate, 4lbs. 6ozs.; artificial manures only, 3lbs. 14ozs. Every ounce per head of increase is equal to about 6cwts. per acre. With cauliflowers earliness of maturity is a great point. It was found throughout that the heavy dressings of nitrates hastened the maturity of the plants; the quality also being superior, an increased softness in the midribs of the leaves surrounding the flower being marked.

It will be seen that taken on the whole the heavier dressings of nitrate of soda have been much more profitable when added to a fair dressing of dung, than a double dressing of the latter. The plots without any dung have in nearly every case beaten the standard plot, though it is most probable that, owing to the absence of humus, these would be more liable to be affected by climatic conditions. Under different soil and weather conditions varying results from the use of the manures indicated would of course be obtained, but the experiments under review are sufficient to emphasise the advantages of a readily soluble fertiliser like nitrate of soda for crops whose profit and quality depend not only on the total yield, but on their rapidity of growth.

Before using nitrate of soda it should be sifted and all the lumps broken. In applying it to small plots 1lb. to the rod represents as nearly as possible 1½ cwt. per acre. In still smaller plots 4ozs. to 8 sq. yds. represents the same dressing. With cabbages, cauliflowers, &c., the first dressing should be given when the plants are set out, and the second early during the period of active growth. With carrots, turnips, onions, and beet the first application should be made when the plants are well above ground, and the second about the time of thinning out. To secure regular distribution of the nitrate it can first be thoroughly mixed with double its bulk of dry soil. In dry weather a sprinkling of water after application of the nitrate will be beneficial.

PHOSPHATE DEPOSITS IN THE NORTH.

On February last Mr. H. Y. L. Brown, Government Geologist, left Adelaide on a visit of inspection to the districts east of Lake Eyre, with a view to closely examine certain localities near which he thought it possible that payable deposits of phosphates might be found. Mr. Brown left Adelaide on February 1 and returned on March 23, and has furnished the Hon. Minister of Mines with a report on his trip, from which the following items of interest are extracted :—

The object of this journey was to examine certain places on the Warburton River where beds of phosphates of a sufficient thickness and extent to be valuable as a source of artificial manure were, in my opinion, likely to occur. On a previous journey, made in 1892, a report of which was furnished you at the time, I obtained fossil bones and other animal remains, which indicated the probable existence of such beds. As the Lake Eyre district at the time of my departure was undergoing a period of severe drought, I deemed it a favorable time to examine the river and creek beds for the purpose above mentioned.

During the time occupied by the journey from Davenport Springs northwards heavy rains fell all over the Lake Eyre region, and on arrival at the Warburton I found the river running strongly. This prevented my making the detailed examination of its bed I had anticipated being able to do. I followed the river down to Punkrakadarina, a waterhole and soakage some forty miles from Cowrie, thinking that the flood might subside in the meantime. It did not, however, but increased in volume as the river was descended, owing, no doubt, to the fact that the river has less fall the nearer it approaches to Lake Eyre. I obtained fossil bones and coprolites at several places, notably at Kalamurina Waterhole, which is a well-known fossil bone locality.

Returning to Kalamurina, I proceeded southwards to the Cooper, over sandhill country, with salt lakes. The distance from Kalamurina to Pirranna Waterhole, on the Cooper, is about fifty miles. Following up the Cooper I obtained a few fossil bones in the dry bed of the creek in the vicinity of the salt waterholes, which occur along its course. At Killalpaninna Mission Station I was told of a locality where petrified trees were to be seen, and also of some localities where bones occurred. With two blacks, as guides, I proceeded down the Cooper as far as Cuttupirra, a large salt waterhole. At several places along the river the surface was strewn with fragments of bones, and in some cases coprolites, containing a large percentage of phosphate of lime. The remains picked up at these places include those of the diprotodon, kangaroo, crocodile, birds, tortoises or turtles, lizards, fish, &c. The fossil trees I found to be fragments of silicified wood, some of which were of considerable size, scattered over the sandy surface, apparently at or near the place where the trees grew, from which they

had been derived. The locality is near the south-eastern end of a salt lake, five miles north of the Cooper, and in a direct line twenty-three miles west-north-west from Killalpaninna Mission Station. Small fragments of similar silicified wood frequently occur along both the Cooper and Warburton, associated with the fossil animal remains.

With regard to the geological structure of the country along the Cooper and Warburton, the uppermost beds, which are of Pleistocene and recent age, consist of sand, silt, sandstone, and clay, and gypsum, containing calcareous and siliceous nodules and accretions. They extend from the surface to the level of the salt waterholes, and seldom attain a thickness of more than 40ft. or 50ft. Underlying these a bed of flinty jasper rock, with siliceous shale and ferruginous matter is sometimes visible, as also a dark-colored sandy and gypseous clay, resembling that forming the upper part of the cretaceous shale formation. The fossil remains although generally found on the surface, are also found embedded in this clay deposit in conjunction with oxide of iron and ferruginous clay. It is the lowest bed and is probably one of those in which the animal remains were originally deposited. The rivers have not cut through any beds lower than these, owing to the level nature of the country, therefore none are visible. The superincumbent rocks are of the mesozoic age, and belong to the great artesian water-bearing system, fossils of both jurassic and cretaceous age having been found in the district. The artesian bore at Mungerannie has proved these beds to have a thickness of 3,370ft. at that place.

The fossil remains found on both rivers comprise crocodile, tortoise or turtle, lizard, bird, fish, kangaroo, and diprotodon, and a jaw with teeth of a carnivorous marsupial; also coprolites and casts of coprolites of various shapes and sizes. These remains may have all been derived from the late tertiary (Pleistocene) beds from which they have been eroded by the action of the rivers in cutting through the strata, but it is probable that some of the fish and reptilian remains may have been derived from the underlying mesozoic rocks. Although the remains are found only where denudation has taken place along the course of the rivers, it is to be inferred that they occupy a widespread area between and adjacent to these rivers. Whether beds of sufficient thickness and extent to render them valuable exist here is a question that can only be determined by actual prospecting by pits sunk in the neighborhood of the localities where the fossils occur in greatest abundance.

As prospecting localities, judging by what examination I have been able to make so far, I would recommend Oolabarrina and Kalamurina on the Warburton, and Emu Camp on the Cooper. The following are some of the localities where the fossils have been collected:—Warburton River—Toopawarinna, Oolabarrina, Mulyaninna, Wadfarkaninna, Kalamurina, Punkrakadarinna. Cooper's Creek—Mundabullabulla, Emu Camp, Cuttupirra.

Analyses of nine different specimens of coprolites collected by me have been made by Mr. G. A. Goyder, Government Assayer, with results as follows:—

Tricalcic Phosphate.

No. 1—Coprolite.....	52·8 per cent.
No. 2—Cast of large coprolite	7 per cent.
No. 3—Coprolite.....	5·2 per cent.
No. 4—Coprolite.....	30 per cent.
No. 5—Coprolite.....	54·6 per cent.
No. 6—Coprolite.....	62 per cent.
No. 7—Coprolite.....	31 per cent.
No. 8—Coprolite.....	63 per cent.
No. 9—Coprolite.....	57 per cent.
White shale	1·7 per cent.

The small amount of phosphate present in some of the specimens is probably due to the phosphate having been replaced by silica, or some other material during the process of fossilisation. The presence of phosphate in the white siliceous shale found in connection with the flint beds is an important fact bearing on the probability of the occurrence of phosphates in rock form.

This report must be regarded as preliminary only, as I was unable to complete my exploration owing to the reasons given above. In view of the importance to South Australia of the discovery of workable beds of phosphates, it is most desirable that a thorough examination of the district should be made to prove their existence or non-existence.

BEST PLACE FOR AN ORCHARD.—It is a common mistake to consider that very rich soil is necessary for the successful cultivation of orchard fruits. This is quite erroneous. Good soil is of course essential, and by good soil we mean soil which is capable of thorough cultivation, which is well drained, and contains an average supply of plant food. Excessively rich soil, such as is found in the alluvial flats along our rivers, is very often altogether too rich, and induces excessive wood growth at the expense of the crop.

VERMIN DESTRUCTION.

The following instructions for preparing and laying poison for the destruction of rabbits and other vermin have been issued by Mr. F. E. Allen, Chief Inspector under the Victorian Vermin Destruction Act. Some of the recipes have been published previously in this journal, but they are now republished for convenience of readers.

Mixing Poisons.

Phosphorised Pollard.—Obtain a quart preserving jar or similar vessel; half fill with water, in which place one stick (2ozs.) of phosphorus. Then pour in sufficient carbon to cover the phosphorus. The carbon, having a much greater gravity than water, will go to the bottom of the vessel, and not mix with the water. Being under the water there is no risk whatever either from it or the phosphorus. In about eight or ten minutes the phosphorus is dissolved. Then pour contents of vessel into 6qts. of cold water, add 12lbs. of sugar, when dissolved add pollard gradually till it comes to the consistency of thick dough, when it is fit for use. The stirring must be continued from the time the contents of the vessel are put into the 6qts. of water until the operation is completed. The mixing vessel must be kept scrupulously clean, and care taken that there are no holes in it. The above will result in about 50lbs. of bait. It is necessary that the phosphorus should be entirely covered with carbon; therefore the smaller the vessel the less carbon is required. One tablespoonful of carbon will dissolve a stick of phosphorus. The bait should be made the night previous to laying when carbon has been used, so that no trace or smell of this latter will remain.

Phosphorised Oats or Wheat.—Quantities—60lbs. best grain, 4galls. water, about 9ozs. phosphorus. Dissolve the phosphorus in carbon and water, as shown in phosphorised pollard recipe. Make $\frac{1}{2}$ gall. of thick paste with flour and boiling water, free from lumps. Place the grain in a revolving machine made for this purpose. When the paste is cold pour the dissolved phosphorus, &c., into it, and stir well until the ingredients are thoroughly mixed. Make a hollow space in the grain to receive the paste and pour it into it. Move the machine to and fro until the grain has caught up all the paste (say, three or four minutes); then turn the machine gently. When the smoke which is created is sufficiently dense to hide the grain from sight turn it out on to clean bagging, spread out on a shady place on, say, some sheets of iron; keep stirring the wheat until all sign of smoke has disappeared, when it will be shortly ready for use. The above strength of phosphorus gives the best killing results. Using a greater strength may defeat the object in view by setting up oxidation of the grain. Many failures are due to this. Although grain may be prepared in open vessels, the use of the revolving machine is infinitely surer and safer. In cases where carbon is not used the following method can be adopted, but it is not considered in any way as good as the above:—Place the grain in a revolving machine. Light a fire close at hand, upon which place two buckets with 2galls. of water each. When the water boils put $\frac{1}{2}$ lb. (four sticks) of phosphorus into one of the buckets, and stir slowly for three or four minutes until phosphorus is dissolved. Pour this mixture into the machine, and add water from the other bucket as quickly as possible. Close the lid and turn the machine slowly for about twenty minutes. If the machine has not been cooled sufficiently to allow the hand to be placed upon it without burning, pour a bucket of water over it and turn for a few minutes. The machine should be turned for five minutes four hours after mixing, and also again for the same time eight or nine hours afterwards. In twenty-four hours the mixture should be taken out and spread at once. Give machine a few turns before taking oats out.

Chaff and Arsenic.—Thirty pounds best green chaff, 2lbs. arsenic, 3lbs. sugar, 1gall. water. Obtain a large zinc-lined case, and spread about 10lbs. or 12lbs. chaff evenly at the bottom. Boil the water and mix sugar in it. Then sprinkle the water over the chaff and shake in the arsenic in pepper-box fashion and mix thoroughly. It is only necessary to damp the chaff sufficiently to make the arsenic adhere to it. This mixture should be spread at once, as rabbits will not eat poisoned food which has changed its natural appearance from fermentation or any other cause. The use of above is not strongly recommended. It will only be found to succeed where there is a great scarcity of feed, and is always most dangerous to stock.

Grain and Arsenic.—Fifty pounds grain, 1lb. arsenic, 4lbs. sugar, 1½gall. of water. Put the arsenic and water into suitable boiler, adding ½lb. washing soda. Boil till thoroughly dissolved, when the water should become tea-colored and no white sediment should be visible on the stirring stick. Add the sugar and then pour the contents over the wheat or oats. Leave the mixture in a tub or vessel for about twelve hours, when all the liquid should be absorbed. The grain can then be spread on bags or iron to dry, when it is fit for use or for putting in tins for future use. In some instances the grain will absorb more water than is mentioned above, but this can be regulated. This mixture will be most useful to persons who are, perhaps, afraid of using phosphorus on account of possible risk of fire in using the latter. However, there is only danger in the latter case when badly mixed. If the phosphorus is dissolved in carbon there is no risk even with imperfect mixing. The killing properties of the arsenised grain are equal to strychnine. The use of the washing soda is strongly recommended, as it increases the absorption.

Apples or Quinces and Strychnine, and Carrots and Strychnine.—Cut into small pieces (an ordinary apple should make fifty or sixty baits). Dust with 1oz. of strychnine to 10lbs. or 12lbs. of fruit, say with a large-sized peppercaster. It is a good plan to mix some pollard or flour with the strychnine, so that it will not dust too thickly or freely. Lay in the plough furrow from 6in. to 3ft. apart, according to the infested state of the place. The advisability of "free feeding" several times beforehand where above poison is to be used. cannot be too strongly recommended; in fact, it is almost essential to success. If the free baits are well taken, success is absolutely certain. The rabbit comes to the furrow eager and unsuspicious, and falls an easy victim. On the other hand, if the free baits are not taken, there is obviously no use in laying the poisoned bait, and some other poison should be tried. In cases where the furrows cannot be readily made good work can be done by laying the poison on scratches similar to those made when trapping. This also applies to other baits, grain or pollard. When poison is taken, the furrows should be replenished until the rabbits cease to take it. It is hard to err on the side of liberality, but very easy to do the opposite. It is far better to have some poison wasting in the furrows than to have a few rabbits left for future breeding.

Carrots, Apples, &c., and Arsenic.—Twenty pounds apples or carrots and 1lb. arsenic; sift the arsenic on dry with a dredger. When using carrots it is advisable to lightly damp them in a thick solution of sugar. With apples this is not necessary, as there is sufficient acid in the apple to absorb the poison.

Jam and Strychnine.—Eight pounds of jam (any kind) and ½oz. of powdered strychnine; mix well and lay on a small piece of bark or wood in a ploughed furrow. In this connection the use of the prepared jams on sale by manufacturing firms is recommended, in view of the fact that a small quantity goes a long way, and the cheapness and certainty of the manufactured article. In country where ants are plentiful it is expedient to put the jam down as late in evening as possible, as this insect readily finds it, and is objectionable to the rabbit.

Method of Laying Poison.

For any poisoning undoubtedly the furrow or scratch is far and away the best. Nothing can equal it for certainty. The attraction to the rabbit is irresistible. It will always come to it to play and scratch on, and therefore must find the bait sooner or later. But when the country does not allow of the use of the plough or the sledge the soil should be upturned by other means. I have noticed cases where the top of the ground has been smoothly taken off, and the poison laid thereon. This is not advisable; the ground should be broken, not smoothed over. As a rule the poison is not so freely taken if laid too near the burrows. It is much more certain if put on their feeding and playing ground.

It is generally accepted that the best time for poisoning is in the summer months, when the grass is dry. Without in any way impugning this belief (which is quite justified by results), I might mention that in the Western District the custom was only to lay poison at the break-up of the summer—at the first autumn rains. I had charge of a large district in which for ten years (from 1880-90) poison was only laid from autumn to the spring, and as soon as summer set in was discontinued, and the work was extraordinarily successful. The most successful results I ever saw were obtained in good green grass, the presumption being that the rabbits took the grain by way of change from the green feed, and I feel assured that if judicious poisoning were done during the winter months or, at any rate, when the grass is green good results would ensue.

It is often advisable to “ring the changes” as regards poisons. What is successful one time may not be so another. The rabbit is somewhat fickle in his tastes according to a variety of causes—such as weather, seasons, and the state of his natural feed—and it is a good thing to find out what it may take best at that particular place or time, and indulge it accordingly. I have had most successful results by pursuing this course.

Great care should in all cases be exercised as to cleanliness in preparing poisons and laying same. The rabbit is cleanly, and keen to detect anything suspicious in the food spread for it.

Poisoning operations, however successful, should always be followed up by other means. There is always a percentage of vermin left quite sufficient to breed up again. These should be got at by digging out, fumigation, or by setting traps in the mouths of the burrows (so that the breeding does and young rabbits be also caught), and not on the runs or “buckheaps,” &c., where the marketable rabbit stands the best chance of being trapped, and the doe mostly escapes to keep up the future supply. No trapping will lead to anything like a satisfactory result unless the burrows are thoroughly worked. But it is undoubtedly best to always destroy the burrows. No work is complete without this. If these are left the house is always awaiting tenants, and be sure they will find occupants sooner or later. This action, coupled with the destruction of harbor—such as fallen timber, log fences, hedges, &c.—is the *crux* of rabbit destruction, and if properly followed must lead to success.

[NOTE.—A stockowner in New South Wales states that if a share is fixed behind the plough so as to turn the soil back again over the phosphorised baits there is less danger of stock and birds being poisoned, while the baits keep fresh for a longer period and are more readily taken by rabbits.—EDITOR.]

“BLOAT,” or tympanitis, is the result of gas generated in the stomach of stock through ravenously eating whole grain, or green, succulent food. A tablespoonful of carbonate of soda in a pint and a half of water will cure it.

THE PRODUCE EXPORT DEPOT.

Its Work in the Past—Shipments and Prices.

REPORT BY THE MINISTER OF AGRICULTURE (HON. R. BUTLER).

I think a concise *résumé*, showing the financial position of the Produce Export Depot and the results achieved, is opportune at the present time. The department was established in 1895, and a review of the work done since that date must convince the most sceptical that its establishment was abundantly justified, and that while of great benefit to our primary producers it has not been a burden to the taxpayer. There are drawbacks as well as advantages in State control, and it is admitted that mistakes have been made, excusable in the initiation of a new State Department.

Dealing first with the financial aspect, I wish it to be clearly understood that the figures have reference to the Port Adelaide depot only, as some critics, not too friendly to State activity on these lines, persist in mixing up the Wine Depot in London with the Produce Depot here—two separate establishments, with accounts kept absolutely distinct.

The expenditure in London in excess of receipts has been incurred in advertising our wines, with the result that our export has nearly doubled, and there is now buoyancy and enterprise instead of stagnation, if not retrogression. The amount spent by South Australia in assisting an industry capable of almost unlimited expansion, and for which our climate is eminently suitable, is small compared with the amount expended by Victoria in the same direction by giving bonuses within the State.

The expenditure of the Produce Depot from 1895 to April 30, 1901, is in excess of receipts by £1,966, not including interest on capital. This excess would have been nearly extinguished had the last season been as profitable as the previous one. The delay in completing alterations so added to the cost of working that the profit, which should have paid the interest, was absorbed in increased working expenditure. To put the position more clearly, from 1895 to June, 1899, the excess of expenditure over revenue was £3,582. This was during seasons of drought, when the work of the department was reduced to a minimum.

For the year ending June 30, 1900 - keeping that year's work distinct—the revenue exceeded the expenditure by £1,435, paying fully 5½ per cent. on the cost of the works built out of loan; while for the financial year to April 30 the excess of revenue is £180 only, the falling off being due not to any diminution of work but to the loss sustained by the delay in completing the additions.

Another factor adding to the expenditure latterly is, that instead of the department doing its own business and procuring direct from merchants necessary packing material, this is done by another department, which charges 6 per cent. for its trouble. On two lines alone—lamb wraps and rabbit crates—the commission paid by the Export Department amounted to £180.

The increased price of coal during the last two years from 14s. 3d. to 19s. 9d. has also materially added to the expenditure. Over £2,000 has been paid for coal the last two years.

Looking at the department from its financial side only it must not be forgotten that, though there is a small deficiency for the six years, it has been made up many times over by additions to the revenue of other public departments. The railway revenue has benefited by thousands of pounds by the carriage of butter, lambs, and rabbits; and Customs and Land and Income Tax Departments also receive increased revenue. The development of our

productions, and the finding of profitable markets, increases the value of our lands and adds to the income of our producers. It is evident that increased prosperity means larger revenue from Customs.

So much for the department on its financial side. I now wish to inform the public how far success has attended the work done, the quantities and values of produce shipped, and the prices realised.

Taking the frozen meat trade first. During the first two years the work was left almost entirely to the department—not only the freezing, but shipping and selling. Latterly so keen has been the competition by outside speculators that only a small proportion of the lambs shipped were sold by the department on behalf of the producers. The numbers treated annually have been—1895-6, 1,751; 1896-7, 10,606; 1897-8, severe drought, no shipments; 1898-9, 38,610; 1899-1900, 89,980; 1900-1, 94,447.

Referring to the prices realised, it is only fair to point out that the average quality of the lambs shipped by the department has not been equal to the average of the total shipments, as large numbers of the best lambs, both in breed and condition, have been purchased by merchants. In 1895 the net return for lambs was about 8s., varying from 6s. to 15s. In 1896 the average was about 7s., varying from 4s. 6d. for very inferior to 10s. 6d. In 1897-8 none were shipped. In 1898-9 the average was about 9s., varying from 7s. 6d. to 13s. 6d. In 1899-1900 the average was 8s. 6d. to 8s. 9d., varying from 6s. 6d. to 11s. 6d. In 1900-1 we have by far the best average price yet realised, being approximately 11s., varying from 7s. 6d. for very light to 15s. 6d. for prime heavy.

The prices are net to the grower at Port Adelaide; and as the lamb breeders improve their flocks to meet English requirements, so will our prices reach New Zealand values.

Our lambs have been graded into two classes. The last season a few very light lambs, representing third quality, were sent early in the season as an experiment, with the result that the third quality made top prices and the first quality the lowest. The next shipment was sold as graded. Prime heavy lambs, averaging 43lbs., made top price (5½d. per lb.), disproving the statement frequently made that lambs of that weight had to be sold at mutton values; prime mutton by the following vessel bringing only 3½d. per lb.

The greatest difficulty is experienced in London in getting the tradesmen to sell Australian meat as such. The consumers buy our meat at high prices, believing they are eating home-grown.

A butcher in Leadenhall Market, in an interview with a representative from Victoria, said—"Any meat that is not Scotch, English, or Welsh, we class as Australian; and when we have none to fit, we sell the poorest meat for the Australian article when it is inquired for."

To remove the prejudice existing, our neighboring state of Victoria is endeavoring to induce a large retail butcher to label Australian meat and sell it as such; and I have written to our London manager suggesting a similar movement on our part, not only for meat, but for other produce.

Frozen Mutton.—This trade has been limited, and London values do not justify the hope of any immediate extension; 13,674 sheep have been received at the depôt. For the small numbers shipped by the department the net return has been about 10s. 6d., while the same sheep are worth 18s. to £1 in Adelaide to-day.

Pork.—Small experimental consignments have been shipped, totalling about 300 carcasses. The net price realised of 2d. per lb. has not been sufficient to justify a regular expanding trade.

Fruit.—The fruit export trade is yearly increasing, mainly in apples. The prices realised by South Australia have been very satisfactory. In fact, the

highest prices made have not been reached by any other country in the world. The department shipped apples as follows:—In 1895, 425 cases; average gross price, 12s. : net, 6s. 1d. In 1896, 392 cases; average gross price, 15s. ; net, 8s. 6d. In 1897, 9,382 cases; average gross price, 10s. 6d. ; net, 4s. 9d. In 1898, 1,041 cases; average gross price, 17s. 3d. to 28s. a case; net, 11s. 1d. In 1899, 1,131 cases; average gross price, 14s. 4d. ; net, 8s. 4d. In 1899, 1,180 cases were damaged in transit by the temperature being too high; the average gross price of these was 8s. 8d., and the net 3s. 5d. In 1900, 2,115 cases were shipped, the average gross price being 12s. 7d., and the net 6s. 7d. For 1901, 4,477 cases have been shipped, out of which 1,041 cases have been already sold, at a gross average price of 13s. 1d., and net 7s. 4d. These prices, extending over so many years, are very satisfactory. The grading and packing has been better done than in either Tasmania or Victoria (so experts say), and a largely extended area devoted to apple orchards of the varieties suited for export may be confidently expected. The Cleopatra, Dunn's Seedling, Stone Pippin, Strawberry Pippin, Rome Beauty, and Jonathan have made the best prices.

Pears.—About 300 cases have been shipped during the six years, and the result generally has been disappointing. Four cases in 1895 netted 10s. 7d. For three seasons the expenses were not covered, and in 1898 and 1900 the grower received 1s. 4d. and 7d. a case respectively after expenses were paid.

Grapes.—For this class of fruit the figures are—1896, 40 cases, gross 17s. 5d., net 12s. : 1897, 429 cases, gross 9s. 10d., net 4s. 2d. ; 1898, 100 cases, gross 11s. 11d., net 6s. 1d. No shipments have been made since 1898. The experimental shipment by the *Warrigal*, known as the "Sutherland process shipment," has just reached London, and should it prove successful a much larger export of our softer goods will be ensured.

Oranges.—The particulars of the orange shipments are as follows:—In 1897, 1,333 cases, gross 11s. 6d, net 5s. 10d. ; 1899, 200 cases, gross 14s. 1d., net 9s. 9d. ; 1900, 503 cases, gross 8s. 5d., net 4s. 8d. The 1900 season's shipments carried very badly, none of the fruit arriving in first-class condition.

Butter.—1,295 tons 11cwt. 3qrs. have been chilled and put on board at the proper temperature. The butter consigned to the department for sale is sent to the Co-operative Wholesale Society, of Manchester, who deal direct with the consumer, their total charges amounting to 3 per cent.

Rabbits.—69,774 crates, containing 1,799,275 rabbits, have been dispatched from the department during the four years ending 1900. The department did not cover working expenses, but as the country was being cleared of a pest, every effort was made to keep the charges as low as possible.

Wine.—The department has shipped to the London Depot 440,234 galls.

To South Africa, under special contracts, shipments have been made on behalf of the War Office of 1,300 tons of oaten hay, 525 tons of jam, 71 tons of preserved meats.

Conclusion.—Small shipments of poultry, eggs, preserved meat, honey, beeswax, olive oil, kangaroo tails and haunches, and other lines have been made, but the volume of business has been so small and intermittent that the prices realised are not a fair criterion of those likely to be obtained if a large and regular business were established. As far as next season's work is concerned, the charges are being revised, and they will be reduced as much as possible, and every effort will be made to ensure that the work will be done thoroughly and expeditiously.

The department, being a Government institution, the public are entitled to the fullest information concerning it: and if, in this brief review, I have given any facts likely to be useful to the producers, I shall be amply repaid for any little trouble I have taken.

NOTES ON VEGETABLE-GROWING FOR JULY.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

In those localities not subject to severe frosts the planting of potatoes will be in hand. Experience has taught that tubers grown under different conditions are the best to use. The potato shows signs of rapid deterioration when tubers are constantly re-set in the locality where they were grown. A quicker start is obtained when the buds or eyes have begun to grow. Those with long sprouts should be avoided, as such growths are likely to be broken away in the planting operations. A sound tuber or piece of tuber, with a limited number of strong buds, is to be preferred to one with many which are weaker individually. A plant with a few strong stalks proves more profitable than another with many small ones. In localities where artificial watering is not possible the tubers should be set from 4 in. to 6 in. deep. Unless the soil is very rich, a good dusting of finely-ground bonedust sprinkled along in the trenches on top of the tubers usually shows good results.

In all operations of planting or sowing, tramping upon the soil while it is very wet should be avoided as far as practicable. To this end it is wise to prepare the ground and set each drill, respectively, as the workman proceeds, rather than make a large plot ready and have to trample upon the newly-dug or ploughed land when setting the seeds or plants.

Cabbage, onion, cauliflower, Brussels sprouts, lettuce, kohlrabi will be set out for successional crops. All of these like rich, deep, well-prepared soils, and should comprise the first kinds to set out upon new land, or old soils which have been recently heavily dressed with farmyard manures.

On land which last season had undergone the above treatment sowings could now be made in drills of carrot, parsnip, onion, swede and ordinary turnip, red and silver beets, broad beans, peas, and spinach. It is always advisable to drill in these crops so that free use may be made of the hoe during their after growth. Small plots of cresses and radish should be sown for salad purposes.

The thinning out of growing crops of carrot, parsnip, turnip, beet, &c., should not be neglected. Every plant must have room for the proper expansion of root and top if high quality is to be obtained. Roughly speaking, from 4 in. to 9 in. should separate each plant.

The hoe should be kept at work between the drills of growing crops, and light top dressings of superphosphate or sulphate of ammonia applied before the hoeing is given, so that the fertiliser may be incorporated into the soil. We should always remember that such cultivation serves other important purposes than merely the killing of weeds.

Growing crops of potatoes and celery should be banked up as required. In windy localities cabbage and cauliflower plants are often assisted by banking or mounding the soil around their stems.

Slugs and snails often prove troublesome at this season of the year. For the destruction of the former, probably no better remedy exists than the frequent application of fresh lime dusted over the beds at night. For the latter, no substitute has yet displaced the tedious process of hand-gathering the pests and putting them into fresh limewater.

The preparation of beds for the planting of asparagus and rhubarb should be taken in hand. For both, the soil must be thoroughly broken to a depth of about 2 ft., and much manure put into the bottom layer. From $\frac{1}{2}$ cwt. to 1 cwt. of bonedust per rod is often used; or a one-horse drayload of well decomposed farmyard manure. This should be supplemented with a handful of common salt per square yard in the case of the asparagus.

In seed beds, made in the open ground, successional sowings of cabbage and cauliflower seeds should be made.

Those desirous of raising early tomatoes or cucumbers should prepare the hot beds and sow the seeds during this month. A couple of loads of fresh stable manure, upon which a box-frame is set, with its top sloping towards the sun, will do. More fresh manure should be piled around the sides of the frame. The seeds should then be sown in pots, pans, or boxes, and the glass or calico shelter set over them. Any necessary watering should be applied early in the morning, upon sunny days, otherwise the young tender plants will damp off. On sunny days the cover should be removed for several of the mid-day hours. This will admit light and air, and strengthen the tissues of the young plants.

ORCHARD NOTES FOR JULY.

BY GEORGE QUINN, HORTICULTURAL INSTRUCTOR.

In most localities cultivation is at a standstill, on account of the sodden condition of the surface soil. It does not by any means imply that the soil has received all the moisture it is capable of holding, or that the subsoil has been fairly soaked when free water lies upon the surface, or runs off the lower portions of the orchard. Orchardists had ample time this year to open the soil roughly before the surface became too soft. On hilly ground the chief objection raised against early ploughing is grounded on the tendency of many soils to wash into ruts. This can be largely avoided by opening furrows about a chain apart—or less if the slope be steep—around the contour of the hill after the ploughing is completed. These obstruct and carry away the accumulating tricklings before they gather much force. Such furrows are, it must be understood, only of a temporary nature, and their positions should be altered at each cultivation. At this time of the year every opportunity should be seized to turn small creeks or drains into the deciduous orchard while they are yet discharging storm waters. Most of our subsoils can be soaked in this manner, and the moisture kept into them sufficiently long to nourish trees and fruit crops by judicious cultivation in the spring and summer.

The planting of deciduous trees will still be in hand, but the unfortunate planter who at this late period seeks through the nurseries for standard sorts will most probably suffer disappointment.

If a young tree, planted a couple of months ago, should be lifted now, young roots are found projecting from the old ones. These imply that as soon as the spring arrives such trees have a distinct advantage in starting to grow. In very early localities citrus trees may be set out: but the rising temperature of the soil is the best guide for this work.

The pruning of deciduous trees is in full swing. Unless one has a large area to prune there is nothing to gain by an early start. The plum, apple, and pear may be dealt with early without much disadvantage accruing, but with the peach and apricot late work has its advantages. With the former the loss due to a tendency to cast off many flower buds—owing, I believe, mainly to their immaturity, caused by a lack of sufficient light when growing—can be largely counteracted by late pruning. In pruning the apricot spurs the presence of good wood buds can be more readily detected, owing to the grey color assumed by the scales on those buds late in winter.

Scions required for grafting purposes should be saved now. The well-ripened shoots of last season provide the best scions. They should be tied in bundles, labelled with a wooden or tin label—paper will rot away too rapidly—and buried in moist, not sodden, soil.

Slugs sometimes damage them considerably, therefore good sharp sand is the best cover for them. Any trees into the arms of which buds were inserted last summer should now receive attention. The arms should be reduced towards the inserted buds. Some people advocate cutting them right back to

the buds, others to leave a stump to which the bud growth may be tied for security. If no pinching can be applied to the bud's early growth, a stub to support it is valuable. As a rule the tying is as time-consuming as pinching, and the one reduction of the arm gives it a better chance of healing than where a stub remains probably to die back deeply into the heartwood below the bud before it is finally removed.

The root-grafting of fruit trees, more particularly in making blight-proof apple trees, will be undertaken now. Sharp knives and deft fingers are essentials to success. The roots should be kept moist during the operation, and the grafted pieces buried in moist soil immediately.

Stones of apricots and peaches may be set out for stock-raising purposes. The season is rather advanced for the latter, unless they have been cracked, or loosened by stratification in earth. The harvesting of citrus fruits is in full swing. Oranges are usually gathered when colored, irrespective of whether the flavor has properly developed. It is to be hoped that more of our growers will try to cure and keep their lemons until the return of warm weather.

Experience shows that the fruits should be cut from the trees as soon as they exhibit slight tinges of yellow upon the skins. They must be handled with great care, as at this stage the surface of the rind is crisp, and scratches or bruises very readily. Cut and carefully handled into boxes, they are then placed in fairly airy sheds for several days to toughen the skins prior to being stored away finally on trays. A cool cellar, exempt from draughts, and packed in single layers on trays, appears to supply all that is necessary to carefully cured and handled fruits.

No time should be lost in setting out strawberry plants. Most of our successful growers favor the early part of June for this work.

If time permits, the scraping-off of loose bark and the cutting-away of jagged stumps, or cleaning out of knotholes, upon apple, pear, and quince trees in codlin-moth-infested gardens may be undertaken. Any old bandages now upon the tree stems should be disinfected before being stored for the winter. As soon as the fruit-house is empty, it should be closed and fumigated with sulphur wherever practicable. The black aphid of the peach may be detected sometimes beneath the young shoots of last year. They usually cluster around the buds. If found, they should be sprayed at once with tobacco wash.

The reddish burrowings of wood-borers should be looked for when pruning all stone fruit trees. If taken in hand as soon as seen the caterpillars may be caught before they penetrate into the hard wood.

The winter treatment of lime, sulphur, and salt may be applied for red spider; but thick gloves should be worn, as it damages the hands severely, otherwise.

Spraying with Bordeaux mixture, for fungus diseases, had better be delayed until the buds start to unfold.

FARM HINTS FOR JULY.

BY THE EDITOR.

As much land as is possible should at once be ploughed; but, if it is heavy and sodden, caution must be observed to avoid clodding the field. In some cases such clods will break down under the influences of night frosts, but in other cases the clods will remain for years. Early fallowing allows the rain to enter the subsoil, and, under the influence of the weather, the soil settles down and forms the "firm bed" so necessary to a cereal crop. If fallowing is left too late the "bed" is left hollow, and when the dry weather comes on the roots perish for want of moisture. Rolling, to crush the clods, and heavy harrowing afterwards to loosen the surface, will, in most cases, prove beneficial.

On most fields, if not in all, the growing cereal crops will benefit from a light harrowing. The object of this is to open up the surface that has been caked through rain, to let in air which is essential to the well-being of the plants, and to induce tillering. Some advanced farmers roll their crops during fine weather, and then use the light harrows. Those who have not adopted these practices should try experiments on a small scale; and when they have proved that their crops have materially benefited, perhaps they will extend the operation to the whole of their fields in the future.

In the near future most of our farmers will probably find it profitable to cater for the butchers, because the use of drills and fertilisers will increase the yields of grain and justify the employment of string-binding reapers, which will gather in the straw. The straw, being harvested early, and before the elements have destroyed the greater portion of its nutritive value, will become an important factor in the sustenance of live stock. The straw when cut early has considerable nutritive value, and that can be increased by using it along with mangolds, or beets, or ensiled with cow cabbage, mangold, or beet leaves, or other similar succulent forage—1ft deep of chaffed straw, then a foot depth of leaves, and so on alternately until the pit is filled.

Between now and harvest a great effort should be made to construct a silo pit. Where the water lies too near the surface a plank silo can be made above ground. The pit should be 8ft. or 10ft. wide at most, 12ft. or more in depth, and as long as may be convenient. Leaflets on silos and ensilage can be obtained at the Agricultural Bureau office, or will be posted if a stamp is enclosed with application by letter.

Sow seeds of mangolds and beets on well tilled and heavily manured land. If the soil is brackish it will be all the better for the crop. On rather shallow soils—of course not too dry—the Globe and other short varieties will do best; on rich, deep, rather moist alluvium the Long Red and Mammoth sorts will do. Sugar beets will also be well suited for the shallower soils. The crop must be grown in drills 2ft. x 1ft. 6in. for sugar beets, and 2ft. 6in. x 1ft. 6in. for mangolds. When the plants are growing they must be reduced to one plant in each spot, as the seed capsules usually contain more than one seed. If removed early enough, without injury to the tap-root, they may be re-planted where gaps exist, but the tap-root must not be twisted or bent.

If every farmer in this State were to establish a goodly number of forest trees on his holding there would, within a few years, be a wonderful transformation in the appearance of the country; and (without any doubt in the minds of the great majority of careful observers) a great improvement in our climatic conditions. The thinnings will be useful for firewood, and in time there will be timber for a hundred different uses. Trees should be protected absolutely against trespassing stock, and should be in clumps of not less than 50 at 8ft. apart, or planted in several rows, say in rows at 8ft. apart each way. They will "rib" the soil to a distance of 50ft. at least when they are 20ft. high, but the shelter to crops will give an increase that will amply compensate for the land occupied by the trees.

Good health and a cheerful active disposition cannot be maintained for a long time without proper food, and the proper food for human beings must include vegetables and fruit. In many places the hawkers' carts and little stores seldom have anything of this sort that is not dear and of very poor quality. The farmer can set apart a couple of acres of good soil, properly enclose it, heavily manure and deeply cultivate it with aid of the farm animals and implements. On this area he can grow vines, certain fruit trees suited to the locality, and sufficient spring and summer vegetables to supply at least his own household. Very many people are in the habit of growing large beds of one kind of vegetable, which all comes in at once, in place of sowing very small lots fortnightly, and thus keeping up the supply.

Sow some rape and white mustard on rich, deep, well tilled soil by preference, but anyhow sow it, even on ordinary well-prepared land. The crop can be fed off or turned into silage. Peas sown in drills 3ft. apart will give a nice lot of seed for pigs and fowls, and the haulms will serve as food for other live stock. It would be well to sow a little Tartanan oats, or some barley, in the drills to serve as support for the peas. If mustard is sown for seed the drills should be 6ft. apart. Rich sandy soil is best for this crop. Turnips for sheep may be sown in drills 2ft. apart. Carrots and parsnips for horses and cows, sow thinly in drills 18in. apart, thin to 12in. in the rows, and frequently cultivate with the hoe. Sunflowers will grow on brackish soil, and, in addition to the seeds, the leaves are of value for feeding stock.

Plant potatoes in light, rich, friable soil, in rows 30in. by 15in. apart, and keep the ground cultivated till the crop is ready to harvest.

Plant out all cattle cabbages, kails, &c., and give each variety plenty of room in which to grow. The richer the soil (in reason) the better for the crop.

Land should be manured and got ready for maize, sorghums, millets, and other summer-growing crops. These must be sown in drills, and must be cultivated several times whilst growing. It is of little use trying to produce such crops on heavy, dry, clay soils, or to do without the frequent cultivation between the drills.

In breeding any kind of animal there can never be a mistake by using the most perfect and pure-bred male. A mongrel or a half-bred male cannot improve his progeny; but if a pure-bred animal is put with an inferior female, there will be every possibility that the progeny will be superior to the mother.

Lucern should be tried wherever the soil is fairly deep, rich, and light. It will thrive even in saline soils. Land should be prepared now, but seed should not be sown until danger of night frosts catching the young plants is past. When the lucern is established frost will not injure it. American seed is usually the best, and the next best is grown at Tamworth, in New South Wales.

EFFECTS OF THE DESTRUCTION OF FORESTS.

By reason of the appalling nature of the famine in India, the attention of men of science has been directed to the study of the forces and conditions that produced it. It is, of course, apparent that the famine is due to the drought, and the drought due to the lack of rain; but that explanation does not satisfy men who are accustomed to look beneath the surface of things in search of primary causes. In this case the study discloses the startling fact that the Indian famines are increasing in frequency and in magnitude; the present one is far more disastrous than any that preceded it. There must be some law at work to produce these appalling effects; and, in the estimation of some eminent authorities, that law is to be found in the relations of forests to water supply. In other words, famines in India are due to the destruction of forests, and increase as the destruction extends.

Prior to the establishment of British law in India a large portion of the country was uncultivated. When order was firmly fixed, and industry was sure of protection, the whole woods and jungles were cleared away over wide tracts of country to make room for grain; and, as a result, the natural reservoirs of moisture were destroyed. Thus there is now less of water storage in the land than in former years. A temporary failure of the rains in their seasons leaves the country parched and barren, and a famine spreads over the land.

It is stated that something of the same evil is to be observed working its way along the Nile. British control has made farming profitable far up the river

in East Central Africa, and the work of forest destruction has begun there, with the inevitable result. Furthermore, it is asserted that even the seemingly inexhaustible forests of Central Africa, in the basin of the Congo, have been so wasted by the axe and by fire within the short time of European occupation that the effect on the water system of the country is already noticeable. The Nile will surely be affected. What then will be the use of the elaborate dams and reservoirs building in Egypt to catch and store the annual rise of the waters, if, through the destruction of forests away up at the sources, the usual heavy continued tropical rains do not fall?

The laws of nature cannot be violated with impunity. She gave the forests as mediums of natural irrigation. If we destroy the means, we lose the end. The law is inexorable. In many countries men now see trickling rills where in their boyhood they saw full brimming streams. And they also see bare sun-scathed hillsides where then they saw dense primeval forests. It is cause and effect, nothing more. But should not rational men learn the lesson?—*Exchange.*

THE ALGAROBIA BEAN.

The Agent-General for South Australia has thoughtfully secured and sent us a few seeds of one of the varieties of *Prosopis*, a genus of Leguminosæ, of the sub-order Mimosæ, and allied to the Carob, or St. John's bread, which last is known in Spain as Algaroba. There are a number of species scattered over the warm regions of America, Asia, and Africa. *Prosopis dulcis* has several species, some of which have been described as separate, and a few of them are cultivated for the sweet pods, called Algaroba, after the Spanish for Carobs. *Prosopis glandulosa* is the Mesquit of Texas and the regions of the West, and occasionally reaches a height of 30ft., yields exceedingly hard and durable timber, and a large quantity of gum resembling gum-arabic. The screw-bean, of which the late Dr. Schomburgk introduced seeds several years ago, and distributed widely here, is *Prosopis pubescens*, and is indigenous in Texas, New Mexico, and California. It is known as the Mesquit, Screw-mesquit, amongst Americans, and as Tornillo by the Sonora Mexicans.

Like most of the Leguminosæ, the *Prosopis* family produce many seeds, which are enveloped in a sweetish pulp, agreeable and wholesome for the animals which feed upon the pods. If the plants can be introduced into our arid northern country they will be a welcome addition to the stock-feeding resources of that part; but more trouble must be taken to establish the plants than appears to have been the case with the seeds distributed years ago by the late Director of our Botanic Garden. As there are very few of the seeds now sent by our Agent-General, they will only be sent to members of the Northern Branches. If they succeed in growing plants from them it will not be long ere seeds can be produced in large quantities for further dispersal.

THE CAMPHOR INDUSTRY is largely conducted in Formosa. At one time it was under no control, and the natives destroyed the trees ruthlessly. Now the business is carried out under strict Government control. Large numbers of trees are annually planted under direction of the Camphor Control Department of Formosa, all stills must be licensed, and only certain grades are allowed to be exported. The total amount of camphor purchased from the licensed stills between August 5th, 1899, and March, 1900, was 20,437cwts., and 15,535cwts. of camphor oil. The camphor tree (*Laurus camphora*) will grow amongst the hills in South Australia almost anywhere south of a line east and west from Burra.

AGRICULTURAL STATISTICS.

Preliminary Return showing the Area of Wheat Sown, the Area Reaped, the Area Not Reaped, the Seasons 1899-1900 and 1900-1901 respectively; also the Area of Wheat Out for

Division and County.	Area under Wheat.				Produce—Wheat.	
	Sown and Reaped.	Sown.	Reaped.	Not Reaped.		
	1899-1900.	1900-1901.	1900-1901.	1900-1901	1899-1900.	1900-1901.
	Acres.	Acres.	Acres.	Acres.	Bushels.	Bushels.
I. CENTRAL—						
Adelaide	17,367	16,162	16,162	—	140,154	181,011
Albert	32,066	36,407	30,387	6,020	150,510	173,228
Alfred	9,112	10,740	8,972	1,768	54,118	71,301
Carnarvon	323	248	248	—	3,242	2,264
Eyre	123,134	117,664	93,106	24,558	396,083	456,022
Fergusson	94,837	110,850	104,932	5,918	509,358	917,932
Gawler	97,265	110,624	95,095	15,529	571,020	1,044,613
Hindmarsh	10,190	11,325	10,248	1,077	85,232	94,393
Light	70,792	106,663	82,118	24,545	556,200	969,173
Sturt	78,457	73,052	60,850	12,202	374,407	340,267
Total	533,543	593,735	502,118	91,617	2,840,324	4,250,204
II. LOWER NORTH—						
Burra	45,610	39,740	21,420	18,320	112,200	85,905
Daly	223,614	214,185	201,577	12,608	952,357	1,453,020
Hamley	—	—	—	—	—	—
Kimberley	33,398	37,754	20,490	17,264	81,854	41,503
Stanley	118,305	126,446	108,922	17,524	730,604	1,124,365
Victoria	121,742	126,509	104,511	21,998	668,793	1,110,405
Young	4,038	4,574	1,828	2,746	9,066	7,138
Total	546,697	549,208	458,748	90,460	2,554,874	3,822,336
III. UPPER NORTH—						
Blachford	16,126	16,804	7,890	8,914	77,982	14,912
Dalhousie	172,490	166,178	142,212	23,966	715,500	676,182
Derby	—	—	—	—	—	—
Frome	147,148	165,343	145,628	19,715	730,864	962,731
Kimberley	65,652	71,661	40,065	31,596	98,984	74,810
Hanson	36,140	36,182	18,380	17,802	72,640	24,685
Herbert	27,366	31,022	8,454	22,568	74,500	14,297
Lytton	—	—	—	—	—	—
Newcastle	70,110	65,212	40,204	25,008	285,866	130,374
Taunton	880	530	90	440	24	185
Total	535,912	552,932	402,923	150,009	2,056,360	1,898,176

SEASON 1900-1901.

the Quantity Produced, and the Average Yield per Acre in each Division and County during Hay, the Produce and the Average Yield per Acre; together with the Annual Rainfall.

Average Yield per Acre			Wheat for Hay.						Rainfall (Approximate Mean).	
Sown & Reaped.	Sown	Reaped.	Area.		Produce.		Average Yield per Acre.			
1899- 1900.	1900- 1901.	1900- 1901	1899-1900	1900-1901.	1899-1900.	1900-1901.	1899- 1900.	1900- 1901.	1899.	1900.
Bush.	Bush.	Bush.	Acres.	Acres.	Tons	Tons.	Tons.	Tons.	Inches.	Inches.
8.07	11.20	11.20	48,274	53,372	50,440	75,950	1.04	1.42	23.201	29.178
4.69	4.79	5.70	2,583	3,307	1,750	1,088	.68	.60	10.876	9.054
5.94	6.60	8.00	851	1,438	618	858	.73	.60	10.176	9.372
10.00	9.13	9.13	588	740	717	832	1.22	1.13	18.422	21.425
3.22	3.88	4.90	13,310	15,693	5,954	10,665	.45	.68	9.958	11.745
5.37	8.28	8.75	14,280	16,029	7,183	14,341	.50	.90	12.419	16.048
5.87	9.44	10.98	32,267	32,978	22,340	40,507	.69	1.23	12.979	17.486
8.36	8.33	9.21	8,770	7,744	9,072	9,060	1.03	1.17	19.602	25.442
7.86	9.09	11.81	34,966	39,877	28,610	49,276	.82	1.24	16.360	21.506
4.90	4.66	5.59	10,673	11,152	7,433	8,033	.70	.72	15.050	16.643
5.32	7.16	8.46	166,562	182,330	134,117	211,510	.81	1.16	14.904	17.790
2.46	2.16	4.01	4,867	5,304	2,028	2,710	.42	.51	10.996	11.485
4.26	6.78	7.21	21,838	29,306	9,735	21,491	.45	.73	10.972	13.569
—	—	—	332	336	194	255	.60	.76	10.176	9.372
2.45	1.10	2.03	2,166	1,569	916	454	.42	.29	11.485	10.340
6.18	8.89	10.32	23,247	24,850	15,354	24,939	.66	1.00	14.935	19.482
5.49	8.78	10.62	32,962	35,970	23,263	42,864	.70	1.19	14.182	16.926
2.25	1.56	3.90	230	150	107	150	.47	1.00	10.876	9.054
4.67	6.96	8.33	85,642	97,485	51,597	92,863	.60	.95	11.946	12.890
4.84	.89	1.90	1,073	495	583	107	.54	.22	10.220	7.480
4.15	4.07	4.80	15,332	15,952	9,783	11,090	.64	.70	11.088	10.986
—	—	—	—	—	—	—	—	—	4.910	5.065
4.97	5.82	6.61	15,630	17,496	12,012	13,026	.77	.74	12.211	14.017
1.51	1.05	1.87	717	670	380	284	.53	.42	8.667	8.363
2.01	.68	1.34	336	138	110	50	.33	.36	7.265	7.732
2.72	.46	1.69	627	167	334	34	.53	.20	6.881	5.755
—	—	—	—	—	—	—	—	—	5.433	5.680
4.08	2.00	3.24	4,614	3,584	3,103	2,061	.67	.58	10.089	7.839
.03	.35	2.06	110	130	20	50	.18	.38	7.346	7.477
3.84	3.43	4.71	38,439	38,632	26,325	26,702	.68	.69	8.411	8.039

AGRICULTURAL STATISTICS,

Preliminary Return showing the Area of Wheat Sown, the Area Reaped, the Area Not Reaped, the Seasons 1899-1900 and 1900-1901 respectively; also the Area of "heat

Division and County.	Area under Wheat.				Produce—Wheat.	
	Sown and Reaped.	Sown.	Reaped	Not Reaped.		
	1899-1900.	1900-1901.	1900-1901.	1900-1901	1899-1900	1900-1901.
	Acres.	Acres.	Acres.	Acres.	Bushels.	Bushels.
IV. SOUTH-EASTERN—						
Buccleuch	5,380	4,737	4,737	—	21,472	26,958
Buckingham	12,707	11,890	11,890	—	111,676	93,230
Cardwell	180	326	326	—	1,350	1,243
Chandos	184	76	76	—	166	428
Grey	8,093	7,376	7,376	—	81,704	97,670
MacDonnell	2,203	2,216	2,216	—	23,894	21,138
Robe	4,496	4,412	4,412	—	38,728	22,262
Russell	10,147	10,951	10,951	—	47,144	52,868
Total	43,450	41,984	41,984	—	320,134	315,797
V. WESTERN—						
Buxton	—	—	—	—	—	—
Dufferin	2,655	2,830	2,356	474	10,750	5,334
Flinders	13,133	15,434	14,197	1,237	88,680	109,970
Hopetoun	4,205	5,405	5,025	380	15,500	28,443
Jervois	30,850	38,396	37,036	1,360	109,375	138,278
Kintore	23,353	23,820	22,094	1,726	60,285	131,339
Manchester	350	90	60	30	770	70
Musgrave	12,868	13,066	11,794	1,272	73,942	72,250
Robinson	38,237	40,283	40,283	—	183,690	270,327
Way	35,364	35,810	35,145	665	131,267	210,424
York	520	254	254	—	1,184	200
Total	161,535	175,388	168,244	7,144	675,443	966,635
SUMMARY.						
I. CENTRAL	533,543	593,735	502,118	91,617	2,840,324	4,250,204
II. LOWER NORTH ..	546,607	549,208	458,748	90,460	2,554,874	3,822,336
III. UPPER NORTH ..	535,912	552,932	402,923	150,009	2,056,360	1,898,176
IV. SOUTH-EASTERN ..	43,450	41,984	41,984	—	326,134	315,797
V. WESTERN	161,535	175,388	168,244	7,144	675,443	966,635
GRAND TOTAL ..	1,821,137	1,913,247	1,574,017	339,230	8,453,135	11,253,148
Increase ...	—	92,110	—	—	—	2,800,013

Chief Secretary's Office, Adelaide, June 10th, 1901.

SEASON 1900-1901—continued.

the Quantity Produced, and the Average Yield per Acre in each Division and County during Cut for Hay, the Produce and the Average Yield per Acre, &c.—continued.

Average Yield per Acre.			Wheat for Hay.						Rainfall (Approximate Mean).	
Sown & Reaped.	Sown.	Reaped.	Area.		Produce.		Average Yield per Acre			
1899- 1900.	1900- 1901.	1900- 1901.	1899-1900.	1900-1901.	1899-1900.	1900-1901.	1899- 1900.	1900- 1901.	1899.	1900.
Bush.	Bush.	Bush.	Acre.	Acre.	Tons.	Tons.	Tons.	Tons.	Inches.	Inches.
3'99	5'69	5'69	367	—	205	—	56	—	—	—
8'75	8'00	8'00	2,324	2,356	2,027	2,194	87	93	15'875	19'187
7'50	3'80	3'80	44	16	34	16	77	1'00	—	—
9'00	5'63	5'63	—	20	—	10	—	50	—	—
10'10	13'24	13'24	5,314	6,684	7,026	9,214	1'32	1'38	26'718	28'116
10'85	9'50	9'50	548	730	647	850	1'18	1'16	20'143	23'193
8'61	5'05	5'05	1,985	2,014	2,063	2,283	1'04	1'13	21'326	24'566
4'65	5'00	5'00	1,513	1,740	1,217	1,303	80	75	15'040	14'664
7'51	7'52	7'52	12,095	13,560	13,219	15,870	1'09	1'17	19'820	21'945
—	—	—	—	—	—	—	—	—	—	—
4'05	1'90	2'30	90	58	56	40	62	70	—	—
6'75	7'20	7'75	2,500	2,762	1,710	2,228	70	81	16'929	21'724
3'69	5'21	5'66	60	230	30	180	50	78	—	—
3'55	3'60	3'73	1,285	1,380	575	810	45	59	9'688	12'732
2'58	5'51	6'00	485	693	165	370	34	53	9'450	15'887
2'20	7'8	1'17	—	—	—	—	—	—	5'883	6'257
5'75	5'53	6'13	1,783	1,272	920	964	52	76	13'732	19'010
4'80	6'71	6'71	2,147	2,260	892	1,587	42	70	10'410	16'710
3'71	5'88	5'99	337	668	183	538	54	80	10'450	15'870
2'28	8'0	8'0	15	—	11	—	57	—	—	—
4'18	5'51	5'75	8,702	9,323	4,542	6,717	52	72	10'932	15'456
—	—	—	—	—	—	—	—	—	—	—
5'32	7'16	8'46	166,562	182,330	134,117	211,510	81	1'16	14'904	17'790
4'67	6'96	8'33	85,642	97,485	51,597	92,863	60	95	11'946	12'890
3'84	3'43	4'71	38,439	38,632	26,325	26,702	68	69	8'411	8'039
7'51	7'52	7'52	12,095	13,560	13,219	15,870	1'09	1'17	19'820	21'945
4'18	5'51	5'75	8,702	9,323	4,542	6,717	52	72	10'932	15'456
4'64	5'88	7'15	311,440	341,330	229,800	353,662	74	1'03	13'203	15'224
—	1'24	2'51	—	29,890	—	123,862	—	29	—	2'021

POULTRY NOTES.

BY D. F. LAURIE.

Poultry Shows.

In the adjoining States during the past few months several important poultry shows have been held; and during the next few months similar shows will be held from time to time throughout all the States. During recent years particular attention has been paid by writers on poultry to the utility side of poultry-keeping, and in consequence a good many have at various times deprecated exhibitions of high-class poultry, and have condemned fanciers or breeders of high-class poultry in general. Unfortunately these people possess the art of attracting public notice, and much harm is thereby done. We hear much of the evil caused by the fancier and breeder of high-class poultry; we hear of the damage done and the obliteration of utility qualities. There is some truth in the matter, but there is still much to be said. Faddist fanciers have wrought much harm; they make a great outcry, are plausible, and are wonderfully thick-skinned; they force their types of birds on the public, and do much to obtain the appointment of judges who favor their fads. These people, and not the genuine breeder or fancier, are to blame. The breeder who is influenced by cash alone also does much harm. He does not breed straight, and is not averse to "faking," &c., nor is he above sharp practice generally. We hear a lot about the degeneration of breeds. Where would any and all of our pure breeds be were it not for the poultry fancier? Would the strict utilitarian or the farmer have kept the old breeds intact? Decidedly not. The knowledge necessary to breed good fowls results in a man being called a poultry "fancier"; yet we never hear of a cow or horse or sheep "fancier." It is entirely to the credit of the fancier that the old breeds are as good as they are nowadays; also, that the many new and useful varieties are at our disposal. Following the well-known laws of breeding, poultry are more prone to reversion and deterioration within a given time than are the slower-breeding farm animals. We have only to look at the general run of farm cattle, horses, &c., to see that a few "fanciers" in this direction are to be desired. You cannot expect high results unless you have high-class stock, and these cannot be obtained unless we have expert breeders to perpetuate their kind. It must be admitted that a great deal of rubbish is sold as pure-bred stock; also that the majority of people have no idea of feeding and attending to poultry of any sort. The farmer breeds an inferior lot of birds with no constitution, as he sells at a low figure, and spreads them far and wide. Those who seem incapable of managing their birds make failures equally with good or bad birds. In neither case can any blame be laid to pure-bred poultry. Pure-bred poultry, the progeny of sound parents, fed on proper food, are as hardy and infinitely more productive than barn door mongrels. The exhibition of high-class poultry serves many purposes. It provides an innocent hobby for many, and affords much enjoyment to those who are unable to keep birds; it fosters the various breeds, and encourages the production of high-class specimens, so that the producers and those who wish to take up poultry-keeping as a commercial venture can see good specimens and become acquainted with the possibilities of breeding. The question of show birds *versus* farm birds is one of degree. While we cannot expect farm birds running at large to appear in show trim, any more than we should expect prize animals in the plough and wagon, &c.; still the novice sees the bird in good condition, and is enabled to judge, after making due allowances, how his own birds are looking. Again, there are unscrupulous persons, as well as ignorant ones, who

offer birds for sale as purebreds which are, in reality, mongrels. The exhibitions of high-class poultry educate people up to a better standard. The most distasteful task I have is, when visiting people, to have to pass an opinion on their feathered stock. They will have an expression of opinion, and doubtless they do not like it when they get it. A man will say, "That is a good bird"; and to avoid pain, and to escape the bother of pointing out defects, I may say "Yes," or the more guarded "Um!" The next man coming along is told that I have praised this bird in unmeasured terms. Even at poultry shows many exhibitors are so wedded to their own birds that they cannot see the merits of better birds which have defeated their own, and abuse flows freely. It is difficult to convince a fancier that his ideas are incorrect.

The formation of poultry-breeders' associations should be not merely for temporary gain in the way of prizes, but more to promote mutual and lasting benefits among their members and throughout the State. I have frequently suggested the formation of such societies, and am glad to be able to announce the first, namely, "The Port Augusta and Northern Districts Poultry, Dog, Pigeon, and Canary Breeders' Association," and the following particulars have been supplied by Mr. W. J. Trembath, the Hon. Treasurer. The objects of the association are as follows:—

1. To awaken and maintain public interest in the poultry industry by lectures, demonstrations, and shows.
2. To foster and encourage individual interest and a spirit of friendly rivalry in the breeding of high-class poultry, &c.
3. To aid by all legitimate means the building up of a successful local and export trade in poultry and eggs.
4. To promote the spirit of co-operation between the members for the effective and profitable marketing and disposal of products.
5. To watch the trend of legislation in relation to the industry, and to make such representations on the question as occasion demands.

The first show will be held on the first Thursday in September. If they succeed only moderately in their objects great good must result. Anything that tends to the introduction of better breeds of poultry will be of benefit to the whole State, and I am glad to see such spontaneous action.

The South Australian Poultry and Dog Society.

The secretary, Mr. Joseph Hill, of Pirie Street, has forwarded me the schedule for the forthcoming show, to be held August 2nd and 3rd. Special attention is directed to the fact that Mr. Alec Anderson, a well-known Victorian judge, will officiate. As usual the Hon. Minister of Agriculture donates £15 as special prizes for the following breeds:—Dorkings, £2; Langshans, £2; Orpingtons, £2; Wyandottes, £2; Indian Game, £2; table fowl for export, £1; ducks, £4. This shows a modification of what I originally recommended some five or six years ago, in view of the importance of the egg trade. I certainly think that the laying breeds should receive as much encouragement as those for table purposes.

It will be noticed, however, that the utility breeds now received the special classification I have so persistently urged, and I have every hope that a further improvement will be made later on. As regards table poultry it cannot be expected that any noteworthy exhibition can be made at this time of year. We must make table poultry a feature of the March show, and I think the Hon. Minister would facilitate matters by directing that the £15 prize money annually given to the R. A. & H. Society should be devoted to and, if necessary, supplemented in providing for a good show of table birds in autumn. We want to show country visitors to the show what should be bred and what they look like. Example is a good preceptor. I hope all who can will visit

one or other of the large shows (in August and September), as there is always much to learn, and there are many who will give a few hints to the uninitiated.

The action of various specialist writers in directing public attention to certain breeds of poultry has caused considerable demand for them. Breeders have not been slow to respond, and in consequence throughout the States we find heavy classes of these breeds at all important shows. A good many high-class birds have been recently imported or obtained from the adjoining States, and later on will no doubt help to improve the quality of our stock. It is an expensive matter obtaining such birds, and those who purchase their eggs and progeny at fair rates are lucky in not running the risks common to life on board ship. It is all as it should be. We must go in for continual improvement, and, as a rule, it works its way downwards, from the direct importer to the farmer.

WEATHER AND CROP REPORTS.

BALAKLAVA (June 24).—Good rains have fallen at short intervals, and in some parts the land is almost too soft for fallowing, while all has received a good soaking. Crops are up and looking healthy, only a small proportion of seed having malted. Fallowing is being pushed on as quickly as possible. Feed is growing again after the check of last month, and if fine weather follows it will soon be plentiful. Frosts so far have been very light. Some farmers report a good percentage of lambs, for which there will soon be good feed.

BRINKWORTH (June 19).—Stock are yet in a low condition. Crops coming up fairly well. Good soaking rains have fallen during the past seven days.

BURRA (June 20).—About 1½ in. rain have fallen this month, which will be of great benefit to farmers, but it is rather late for stockowners.

BURRA WEST (June 24).—Another good rain, making 3·40 in. for the month, and 5·50 in. for the year to date. The wheat is coming up now, but feed is very scarce. Lambing is the worst experienced for years, on account of the scarcity of green feed for ewes.

FINNISS (June 16).—Good rains have fallen during the month, totalling about 4½ in. Ploughing is in full swing.

GAWLER RIVER (June 17).—Since the recent rains the farmers have been enabled to proceed with seeding operations. A few have commenced fallowing. The early-sown wheat came up patchy, and it was feared the seed had malted, but since the rain it has nearly all sprung. Owing to the cold weather feed is growing slowly. Orchard work (pruning, ploughing, &c.) is in full swing.

KAPUNDA (June 19).—Feed is very backward. The early and late sown crops are coming up at the same time. A portion of the early-sown seed has malted, as the weather was not wet enough to get it rooted; that sown later in the dry land is uninjured, and is coming up now, after lying in the ground for six weeks. Seeding is nearly over, but the season is late, and the land is very boggy.

MALLALA (June 20).—Welcome rains have fallen over the whole district. Fears regarding malting have now vanished. A considerable number of sheep and lambs have died owing to scarcity of feed. One farmer states that, owing to blindness, one-half his flock cannot find sufficient feed. Many are busy with tree-planting, and the majority have commenced fallowing.

MILLICENT (June 19).—The weather is now getting wintry. Heavy north-west to south-west gales, with rain and hail; country very wet, and submerged in parts. Some crops are coming up well, but sowing not finished yet, principally owing to non-receipt of manures. Rain for June to date, 4·80 in. Stock generally looking well and bringing good prices. Weather clearing a little now.

MOUNT BRYAN EAST (June 22).—The season has been a severe one to stockowners. The percentage of lambs will be small. Splendid rains, however, have fallen this month, about 2½ in. being registered.

MOUNT PLEASANT (June 20).—Stock very poor and feed prospects bad for the next two months. Tilling proceeding rapidly. Rainfall for year to date, 3·92 in.

MOUNT REMARKABLE (June 18).—The total rainfall recorded here since last report amounts to 1·54 in., and the outlook for wheat crops is now more hopeful; but the rain has come rather late to promote much growth of feed, which is scarce. The lambing returns will be poor. Occasional light showers, with strong winds, are now falling.

NANTAWARRA (June 22).—Stock are not improving in condition, as the weather is too cold, and, although splendid rains have fallen, feed is growing slowly. Rainfall for the month to date, 2·68 in.; for the year, 7·10 in. Since last report the wheat has come up very well, considering the time it lay in the ground. All farmers are busy fallowing, and the ground is working well.

PASKEVILLE (June 24).—The weather for this month has been very satisfactory after a dry May. Nearly 4in. have fallen, giving the ground the best soaking it has had for years. The wheat has started vigorously, and, contrary to expectations, there has been little or no malting. Feed is scarce, as vegetation, which started with the April rains, died away, and is only just restarting. Stock are not doing well, and there are few lambs to be seen in the district. Seeding, which was late owing to absence of rain, is now completed with but a few exceptions, and fallowing is general.

PINE FOREST (June 25). Nice rains (·69in.) have fallen during the month, making a total of 5·29in. for the year. Crops sown before the 1st April are now well covering the ground, and are looking splendid. A few farmers have not finished seeding, while others are busy fallowing. Sheep are not well supplied with feed; consequently good mutton is scarce and dear.

PORT PIRIE.—Wheat sown before the April rains came up, and in some instances died off. For June, to 25th, 2·29in. have been recorded. This will revive the crops and bring up those on the sandy lands which had not come through. All kinds of stock have suffered considerably during the past month or two. The April rain started the feed, but, being followed by continued dry weather, made no progress, and was soon eaten off, and stock had to fall back on the dry grass. The lambing, however, was good, but the June rains and cold weather have caused considerable losses.

REHILL (June 28).—About 2in. of rain have fallen. Wheat and grass growing very slowly. The first three weeks of the month the winds were mostly northerly, with scarcely any from south or west. On the 27th and 28th sharp frosts were experienced. Fallowing is in full swing.

STRATHALBYN (June 20).—Good rains have fallen, recording about 6in. since the beginning of the month. Feed is getting plentiful.

WATERVALE (June 22).—The crops in this district are considered to be very dirty, owing to the want of rain earlier in the season.

WILMINGTON (June 26).—The weather keeps dry and frosty, and is badly affecting farming and grazing. In many parts the young plants cannot break through the surface. There is very little feed, and the outlook is getting serious.

WILSON (June 24).—During the whole month the weather has been windy, cold, boisterous, and frosty, with a few light showers of rain, which dies out nearly as fast as it falls. If this continues much longer the coming season will be even worse than the last, as the crops will have no chance of getting through the soil.

YANKALILLA (June 20).—Up to the present about 6in. of rain have fallen for the month. Much more land will be put under crop this year than for many seasons past, and a large quantity of artificial manure has been imported. The seed drill is coming into general use. On some of the farms experiments are being tried in the quantities of manure used, ranging from 80lbs. to 2cwts. per acre. Some sandbreaks have occurred on the sandhills, and these are being planted with Marram grass. The roots are obtained from the grass planted by Mr. Macmillan some years ago.

FARM AND DAIRY PRODUCE MARKETS REVIEW.

Messrs. A. W. Sandford & Company report:—

July 1, 1901.

Wild stormy weather raged during the ten days of mid-month, giving in the older districts good rains, but unfortunately falling meagrely in our drier agricultural parts; still enough has been received to give vegetation another start, and feed is looking as well as can be expected under the frosty conditions that are prevailing since the last rains.

Country trade is reported to be a little better, and in the city business in most directions is active, the coming Ducal festivities causing money to be expended in decorations and other preparations for next week's festivities. The very satisfactory first crushing at Tarcoola gives further reason to think that a new goldfield in this quite fresh direction will probably be opened up. Should a permanent mining population become established here it would have a most important bearing upon the settlement, not only of our North-West pastoral country, but also in the question of the suggested federal railway from our system to Westralia, as Tarcoola is something like 300 miles directly on the route towards Kalgoorlie from Port Augusta, traversing on the way some copper-bearing country that would be extensively developed if it had a railway.

The demand for wheat, caused by shippers' and millers' necessities to fill orders which existed when last we wrote, continued for a couple of weeks, until 2s. 10½d. per bushel had to be paid for some parcels, although British prices were steadily drooping. The completion of shipments and setting in of wet weather, causing holders to relax somewhat, however, gave the market an opportunity of adjusting itself to outside influences, so that a run down of fully 2d. a bushel was made in a few days, and values can now be reckoned as about equivalent to European quotations. Glowing accounts of the prospects of the wheat crops in the Northern

Hemisphere continue to reach us ; and as harvesting has commenced in the earlier countries, we may calculate the prospects for higher prices during the coming season as not being too bright, though so many risks have yet to be passed before all is safely garnered there is no absolute certainty of a heavy season's surplus. In view of the outlook American sellers are keenly pushing business in every direction, and successfully competing with Australian merchants even in South Africa and China, where a large body of European soldiers and marines have to be provided for, as well as in other places where Australian breadstuffs are usually consumed. A little trade in flour is passing to Western Australia, and a few parcels have been sent to Mauritius, but local demand is confined chiefly to filling contracts made at beginning of the season ; values remain as when last quoted. The change to moister conditions caused speculators to push sales of bran and pollard, so that dealers' quotations were for a time lower than millers' rates, causing stocks to accumulate somewhat in the hands of latter, and a drop in prices seems imminent. Although exports of hay during the month consisted mostly of oaten shipped on War Office order, there has been a slight firming in other sorts, and chaff is quoted 6s. higher. Feeding grains have remained unchanged.

In potatoes steady business was doing until about mid-month, when speculation, partly excited by heavy South African orders, began to manifest, since which a rise of 40s. a ton is shown, with holders disinclined to quit even at the advance. This applies to growers in Tasmania, and also at Mount Gambier, where stocks are now down to under 1,500 tons, so that the bulk of supplies here for next couple of months at least will have to be imported. The very severe frosts during the past few nights will not help along the new earlies, though most of them are hardly advanced enough yet to suffer much injury. The holders of onion stocks rather overshot the mark in their endeavor to force up price, which resulted, as we expected, in restricting the consumption of the favorite bulb, so that values had to give way about £2 a ton at Mount Gambier, where holders are anxious to reduce stocks.

In all lines classed as dairy produce a very full month's trade for June was put through. Local supplies of butter are increasing, though as yet but slowly, and it is likely that for another month we will still have to import, though in lessening quantities, to assist in filling local wants. Values show steady weakening tendency, though for a week or so an upward movement in New Zealand seemed likely to force values higher here again ; but as the market in that colony is now drooping, we may expect, with probably the usual slight fluctuations, a steady lowering towards spring rates to prevail from now on. About the middle of the month eggs began to fall away in price, and have steadily eased since, as if the seasonable drop in value had set in, though it seems yet too early. A considerable quantity of preserved had been laid by this year, and the importation, at comparatively low price, of eggs from China to Sydney no doubt has helped to lower values throughout these States ; but in spite of appearances we expect to see a short temporary revival before the real seasonable downward movement occurs. About half our requirements in cheese are being imported, but demand is at minimum, as usual in midwinter, and there is no change to report in price. Bacon is being dealt in largely, owing to the high prices locally of all butchers' meat, and values maintain. Hams have been dull of sale, and are easier. Honey is again quiet, but as stocks are rather well held just now, no marked drop in price is shown. Beeswax finds ready sale. The supply of almonds is very short of demand.

For carcass pork and veal values ruled satisfactorily until the closing sale of the month, when they gave way a little, but no serious drop is apprehended owing to the comparatively high rates ruling for beef and mutton. An unexpectedly sharp fall in the Victorian Pig Market really caused the easing above referred to here. Poultry has been reaching the city in large quantities, but values have well maintained, excepting for turkeys, which are unusually plentiful, and, in consequence, ruling relatively low at present.

MARKET QUOTATIONS OF THE DAY.

Wheat.—Port Adelaide, 2s. 8d. to 2s. 8½d. ; outports, 2s. 7d. to 2s. 8d. per bushel of 60lbs.
 Flour.—City brands, £6 to £6 5s. ; country, £5 17s. 6d. to £6 per ton of 2,000lbs.
 Bran and Pollard.—11½d. per bushel of 20lbs.
 Oats.—Local Algerian and dun, 2s. to 2s. 2d. ; prime stout feeding, white, 2s. 9d. up to 3s. 3d. per bushel of 40lbs.
 Barley.—Malting, 3s. 8d. ; Cape, nominal at 2s. 3d. per bushel of 50lbs.
 Chaff.—£3 5s. to £3 10s. per ton of 2,240lbs., bags in, dumped, f.o.b., Port Adelaide.
 Potatoes.—Gambiers, £6 15s. ; Tasmanians and New Zealand, £7 10s. to £7 12s. 6d. per 2,240lbs.
 Onions.—Locals, £10 to £11 ; Gambiers, £10 per 2,240lbs.
 Butter.—Creamery and factory prints, 1s. 3½d. to 1s. 5d. ; private separator and best dairy, 1s. 2d. to 1s. 4d. ; good store and collectors', 1s. 1d. to 1s. 2d. ; New Zealand bulk, 1s. 2d. to 1s. 3d. per pound.
 Cheese.—South Australian factory, 8d. to 9½d. ; New Zealand, 9½d. to 10d. per pound.
 Bacon.—Factory-cured sides, 7d. to 7½d. ; farm lots, 6½d. to 6¾d. per pound.
 Hams.—South Australian factory, 8d. to 8½d. per pound.

Eggs.—Loose, 11½d.; in casks, f.o.b., 1s. 1d. per dozen.
 Lard.—In bladders, 8d.; tins, 7½d. per pound.
 Honey.—Up to 2½d. for best extracted, in 60lb. tins; beeswax, 1s. 1d. per pound.
 Almonds.—Soft shells, 6d. to 6½d.; kernels, 1s. 2d. per pound.
 Gum.—Best clear rattle, 2d. per pound.
 Dressed Poultry.—Turkeys, 6½d. to 7d. per pound; fowls, 1s. 4d. to 1s. 7d. each.
 Carcass Meat.—Nice shop pork, 4½d. to 5d.; baconers and medium porkers, 3½d. to 4d. choppers and rough stuff, 2½d. to 3½d.; veal, prime, 4d. to 4½d. per pound; poor and light carcasses, from 2d. to 3d.
 Live Poultry.—Good table roosters, 1s. 7d. to 2s. each; good hens and fair cockerels, 1s. 2d. to 1s. 6d.; fair quality, 1s. to 1s. 2d.; a few pens of light and poor birds, from 9d. to 11d.; ducks, 2s. to 2s. 6d.; geese, 2s. 9d. to 3s. 6d.; pigeons, 5d.; turkeys, 4d. to 5½d. per pound, live weight, for fair to good table birds.
 Above quotations, unless when otherwise specified, are duty-paid values on imported lines. Grain, flour, and forage for export are f.o.b. prices at Port Adelaide. Dairy products are City Auction Mart rates. In grain, chaff, and potatoes sacks are included, but weighed as produce. Packages free with bulk butter and cheese.

MONTHLY RAINFALL.

The following table shows the rainfall for the month of June, 1901:—

Adelaide	4.91	Hoyleton	2.75	Macclesfield	6.90
Hawker	0.65	Balaklava	2.67	Meadows	9.53
Craibcock	0.58	Port Wakefield	2.00	Strathalbyn	6.53
Wilson	0.63	Saddleworth	2.90	Callington	3.64
Gordon	0.40	Marrabel	2.35	Langhorne's Bridge..	4.23
Port Germein	0.31	Riverton	3.79	Milang	3.82
Port Pirie	0.93	Tarlee	3.25	Wallaroo	1.57
Crystal Brook	1.35	Stockport	3.22	Kadina	2.11
Port Broughton	1.45	Hamley Bridge	2.99	Moonta	2.66
Bute	1.97	Kapunda	3.66	Green's Plains	3.22
Hammond	0.37	Freeling	3.57	Maitland	3.23
Bruce	0.38	Stockwell	3.73	Androssan	2.49
Wilmington	1.30	Nuriootpa	4.53	Port Victoria	2.36
Melrose	1.73	Angaston	4.56	Curramulka	3.04
Booleroo Centre	1.29	Tanunda	5.14	Minlaton	3.60
Wirrabara	1.79	Lyndoch	5.25	Stansbury	4.83
Appila	1.68	Mallala	3.11	Warooka	3.26
Laura	2.21	Roseworthy	3.59	Yorketown	3.27
Caltowie	2.03	Gawler	4.09	Edithburgh	—
Jamestown	1.23	Smithfield	2.63	Fowler's Bay	1.49
Gladstone	2.05	Two Wells	3.52	Streaky Bay	2.16
Georgetown	2.27	Virginia	3.23	Port Elliot	2.77
Narriady	1.24	Salisbury	2.85	Port Lincoln	4.28
Redhill	1.35	Teatree Gully	5.88	Cowell	1.36
Koolunga	1.26	Magill	5.30	Queenscliffe	3.19
Carrieton	0.89	Mitcham	5.53	Port Elliot	5.85
Eurelia	1.14	Crafers	9.43	Goolwa	3.85
Black Rock	1.02	Clarendon	2.81	Meningie	5.64
Orroroo	1.01	Morphett Vale	4.01	Kingston	6.68
Johnburgh	0.78	Noarlunga	3.67	Robe	5.14
Petersburg	1.55	Willunga	6.59	Beachport	5.19
Yongala	1.39	Aldinga	4.54	Bordertown	4.84
Terowie	1.67	Normanville	5.49	Wolsley	3.81
Yarcoowie	1.73	Yankalilla	6.85	Frances	4.46
Hallett	2.16	Eudunda	2.63	Naracoorte	5.11
Mount Bryan	2.07	Truro	3.56	Lucindale	5.05
Burra	3.17	Mount Pleasant	7.70	Penola	4.81
Snowtown	2.19	Blumberg	3.07	Millicent	5.43
Brinkworth	1.73	Gumeracha	8.46	Mount Gambier	5.51
Blyth	2.09	Lobethal	8.89	Wellington	3.54
Clare	4.08	Woodside	8.71	Murray Bridge	3.35
Minarto Central	4.62	Hahndorf	8.87	Mannum	2.66
Watervale	5.33	Nairne	7.10	Morgan	0.61
Auburn	3.90	Mount Barker	7.42	Overland Corner	0.61
Manoora	3.07	Echunga	7.13	Renmark	0.65

CENTRAL AGRICULTURAL BUREAU.

WEDNESDAY, JUNE 12.

Present—Mr. F. E. H. W. Krichauff (Chairman), Sir Samuel Davenport, Professor Perkins, Messrs. H. Kelly, M. Holtze, T. R. Robson, C. J. Valentine, A. Molineux (Secretary), and Geo. Quinn (Horticultural Instructor and Inspector of Fruit).

Codlin Moth Regulations.

This was a special meeting called to consider motion of which Mr. Robson had given notice, namely, "That, in the opinion of this Bureau, the restrictions upon the sale of codlin-moth-infested fruit should be removed."

In moving the motion, Mr. ROBSON said he did not desire that the regulations in force should not be carried into effect, but that all the regulations made should be such that they could be strictly enforced. He did not favor removal of all regulations dealing with the codlin moth question. In fact he supported the resolutions passed at the Penola Conference recently. He disagreed with the regulations that were useless and ineffective. It was impossible to stop the sale of codlin-moth-infested fruit. A grower might go over his fruit carefully, yet in a week's time the fruit that was apparently clean would contain a lot of caterpillars. He contended that the regulations had failed in both the objects they had in view—to stop the spread of the pest and to induce growers to improve the condition of their gardens. The caterpillars would be effectively destroyed when the fruit was consumed, and there would be less danger of the pest spreading than was the case at present. The General Secretary had stated more than once that the agitation for removal of the restriction against the sale was chiefly confined to the smaller growers and those who were not mainly dependent upon their apples for their income. This, however, was not the case, many large growers of apples demanding the removal of the restrictions. At present, however careful a grower might be, he was always open to the risk of prosecution because he might miss one or two infested fruits. In Victoria the regulations dealing with orchard operations—scraping, bandaging, spraying, and picking infested fruits—were considered sufficient, and they should be here also. Growers, for their own protection, would refrain from mixing infested fruits with the good. Customers who cannot afford to buy the best would gladly purchase codlin-moth-infested apples at a cheaper rate. The clean districts should have ample powers to prevent the introduction of diseased fruit.

The CHAIRMAN said the Conservator of Water had informed him that the apples he had purchased in Melbourne were invariably infested.

Mr. KELLY supported. Not only in Melbourne but at Bendigo it had to be stated that it was impossible to buy apples unaffected.

MESSRS. HOLTZE and VALENTINE said that their experience had been very different. Plenty of good clean apples, free from codlin moth, were sold in the streets of Melbourne during the recent celebrations.

Mr. VALENTINE said he would move an addition to Mr. Robson's motion, if it were carried. This would be to the effect that it be an offence to sell diseased fruit unless the purchaser was informed that the fruit was diseased. Consumers had a right to demand good fruit if they paid for it.

At the request of the Chairman, Mr. Quinn dealt with Mr. Robson's contentions, and gave his reasons for advocating the retention of regulations preventing the sale of infested fruit, and consequent distribution of the pest. Considerable discussion took place, and it was decided to postpone decision on the motion until next meeting.

Professor Lowrie.

On motion of Mr. KELLY, seconded by Sir S. DAVENPORT, the following resolution was carried without dissent, the official members refraining from voting:—"That this Bureau is of opinion that the services of Professor Lowrie are of such vital importance to the development of the agricultural resources of this State that no action adverse to their continuance should be permitted for a moment to interfere with them, and consequently that no cause inducing their cessation should be allowed to stand in the way of his services being retained by the State."

MONDAY, JUNE 24.

Present—Mr. F. E. H. W. Krichauff (Chairman), Sir Samuel Davenport, Messrs. Thos. Hardy, M. Holtze, R. Homburg, H. Kelly, W. C. Grasby, T. R. Robson, Hon. A. W. Sandford, M.L.C., A. Molineux (Secretary), and Geo. Quinn (Horticultural Instructor).

Hardy's Mammoth Olive.

Mr. HARDY reported that he recently had the olive bearing his name analysed to test its oil-producing qualities. Samples sent to the School of Mines contained 27.8 per cent. of oil, whereas samples of Boutillion olive from the plantations near the Adelaide Gaol showed only 15 per cent. The latter was reputed to be a first-class olive for oil production. Hardy's Mammoth was a local seedling, and bore well every other year.

Extracts and Translations.

The CHAIRMAN tabled the following:—

Reports on the Woburn Experimental Fruit Farm.—His Grace the Duke of Bedford has kindly sent me these particulars, which deal chiefly with apple trees, strawberries, and potatoes. The trees and strawberries were mostly planted in 1894. The ground was heretofore used for the ordinary rotation of farm crops on a sandy moderately fertile loam, some 9in. to 10in. deep, resting on Oxford clay. It was trenched before planting, but, except in a few special cases, no manure was applied till the next year, consisting of at the rate of 94lbs. of potassium sulphate, 152lbs. superphosphate, 32lbs. magnesium sulphate, and 97lbs. nitrate of soda per acre; for at first only a distance of 6in. beyond the extension of the roots was manured. Only the nitrate of soda was applied in spring, the other constituents in autumn. The cost of the fertilisers was £1 10s. per acre. As regards apple trees, the following features were used to measure the vigor of the young trees more than the amount and quality of their fruit:—1. The size of the leaf. 2. The total leaf-area of a tree. 3. The length of new wood formed. 4. The number of new shoots. Some of the trees also received no manure, others no phosphate, or no potash, or no nitrate; others were neglected and grass allowed to grow. There was an approximate constancy of the difference between the effect on the growth of the wood and that of the leaf. In the first report of 1897 the following results of neglect are mentioned, viz:—Not trenching the ground caused 17 per cent. loss in leaf measurement; careless planting, 25 per cent. loss; growth of weeds the first year after planting, 44 per cent. loss; absence of manure, 23 per cent. loss; reduction of wood growth by grass up to 74 per cent. loss. The leaves of grass-grown trees were much lighter in color, and shed earlier. The grass-grown trees were, after five years, scarcely bigger than when planted; their increase in weight was very much smaller than on others. The grass absorbs in part plant nourishment, although out and left on the plots; but it prevents the hoeing and aeration of the soil, and, lastly, promotes evaporation from the soil, both directly from the leaves of weed or grass, and indirectly through cracks in the soil, from which moisture escapes. The last seems to be the worst. Fourteen years' experiments by Greaves showed that, in a sandy ground, the average annual evaporation from the soil, when turfed, was 18'in., against only 42in. from the exposed soil. It is possible that grass round older and well-established trees may have but a small effect upon them; it is different with newly-planted trees. Root-pressing or re-planting have caused nearly the same loss—92 and 91 per cent. respectively of the trees were, after root-pruning, at once re-planted, and if the others were left for two days in a shed before being re-planted. In the report of 1900, the main interest centres upon the manuring; but the

slight effect, as recorded, is of no real importance; but, while almost ineffectual at Woburn, where the soil was trenched, dug, and repeatedly cultivated, it would be ridiculous to come to the conclusion that fertilisers are not required in other soils, or after the trees have borne a number of heavy crops. Besides, His Grace confesses an almost absolute ignorance of the manurial requirements of fruit trees, and, according to analyses, the food material in the soil was ample for the production of many full crops and of wood formation. So long as young trees grew well and made sufficient new wood every season; no manure was required. The results of the manurial experiments, dividing them into three classes, were:—First plot, having manure in excess of the normal quantity mentioned, showed an increase of 0·8 per cent. leaf-weight, 2·0 per cent. in size of trees, or a mean increase of 1·4 per cent. On thirteen plots on which the usual quantity of manure was applied, there was an increase of 1·5 per cent. of leaf-weight, 0·7 per cent. in size of trees, or a mean gain of 1·1 per cent. On seven plots, having less than the normal quantity of manure, there was a loss of 2·6 per cent. in leaf-weight, 0·3 per cent. in size of trees, or a mean loss of 1·4 per cent. The effect of planting trees 4ins. higher or lower, respectively, than where they had been growing in the nursery, was that the leaf-weight of the low-planted trees showed, on the average, only a loss of 2 per cent. below trees planted normal; but there was no bad effect on the low-planted trees, and with some of them the number and length of new shoots were much above the normal. It was probably in consequence of the four or five exceptionally dry summers. Wet seasons might have given different results as regards low and high-planted trees. In Woburn, high-planted dwarfs gave practically a normal leaf-weight. The condition of the soil at the time of planting is of great importance; if not in good working condition the roots cannot be well spread nor properly covered. The prevention of fruiting in young dwarf trees by the removal of blossoms resulted in an increase of 4 per cent. in the leaf-weight above the normal, and also of 4 per cent. in the size of the trees; Stirling Castle only showed an excess to 28 per cent. Standard trees had hardly borne any fruit yet, so that the removal of blossoms had produced practically no effect on the growth.

Strawberries.—Close planting has a bad effect on the crops. In every year those which were planted 1ft. apart gave a smaller yield; in fact, little over half the yield than where planted 18ins. apart. The supply of light, air, and moisture available for each plant was too much reduced. Alteration in the quantity of the manure applied, from 12 tons to 30 tons to the acre, produced little or no appreciable effect on the results. With this short-lived, low-growing, somewhat delicate plant, the crop must depend largely on the blossoming period, a slight difference in moisture, a slight depression in the ground, shelter from radiation, the wind may make all the difference, and any testing of the varieties (of which there were 64) will probably be unsatisfactory. Liquid dressings during the fruiting season, viz., 1qt. four times a week, produced, with water and with sulphate of ammonia, no appreciable effect; with nitrate of soda, from 10 per cent. to 15 per cent.; with nitrate of potash, an increase of 34 per cent.

Seed Experiments.

The CHAIRMAN inquired concerning a number of different seeds distributed by the Bureau in past years.

The SECRETARY explained that most of the plants mentioned had proved quite unsuited to our climatic conditions. In other cases he was sorry to say the reports had not been received. Reports and samples were tabled at the Branch meetings from time to time, and these reports were published in the *Journal of Agriculture*; but, in too many cases, recipients failed to carry out their implied promise to sow the seeds and report results in due course. He believed a large number of useful plants had been, and were being, grown from seeds imported by the Bureau; but, for the reason given, he was unable to furnish any definite information on the subject.

Mr. HOMBURG thought it was most important that reports should be furnished by recipients, and in the event of their failing to do so the Central Bureau should know about it. It seemed to him that some definite arrangement was required, by which they could have seeds of reputedly valuable plants carefully tried and accurate reports furnished for the information of the public. Some better arrangement than the present was imperative.

Mr. SANDFORD thought it would be well if they could keep the Branches more in touch with the Central Bureau. They did not know sufficient of what was being done by the Branches; and he also thought sufficient interest was not taken in the Branches by the members of the Central Bureau. The Secretary had suggested that the members should visit the Branches oftener,

which he thought might be done. As they had a capable Assistant-Secretary, there was no reason why the General Secretary himself should not go out more, and so keep up the interest in the Bureau work. The Secretary might also report monthly on the progress of the work, on the Branches that were asleep, and on those that wanted a little stirring up.

Branch Finances.

The CHAIRMAN thought the Secretary should obtain from the various Branches particulars of the amounts contributed by the members to pay the various expenses in connection with their work. It was generally thought that the department paid all these expenses, but this was not the case, and several of the Branches made levies upon their members.

The SECRETARY said that every Branch had to find its own meeting room, pay for advertising when necessary, and also meet any incidental expenses that might be required. Some subscribed for periodicals dealing with agricultural matters, others purchased bulls for use in the localities, seeds for trial, &c.

Codlin Moth Regulations.

The SECRETARY reported receipt of resolutions from the following Branches, protesting against the proposal to remove or relax the present prohibition of the sale of codlin-moth-infested fruit, viz., Belair, Clare, Angaston, Millicent, and the South-Eastern Conference held at Penola. The Hon. Minister had also forwarded resolution to same effect, passed at meeting of growers from Laura and Wirrabara, and representing 20,000 apple trees.

The CHAIRMAN intimated that the whole subject of the regulations was open for discussion, and asked Mr. Quinn to speak on the matter.

Mr. QUINN said he was desirous that the members should view this matter in a broad light, as it was likely to affect the fruit-growing industry generally. He regarded the production of apples for export as the most promising side of fruit-growing in this State. It was impossible to separate the apple-growing industry from the codlin moth question. The area now under apples in the State made it imperative that the oversea and inter-state markets should be kept open to our produce. If the export trade stopped, or was curtailed, the local market would be reduced to such a condition that apples and pears would not be worth carting to market, and a promising source of wealth would be destroyed. The heavy charges at present ruling in connection with shipping to the European markets made it quite useless to send anything but the soundest and best fruits. The other States of the Commonwealth each possessed laws forbidding the introduction of fruits affected by codlin moth: Cape Colony and Natal also possessed similar restrictions, so that if the export trade was to be maintained the quality of the produce must be retained at a high standard. From sending 647 cases of apples to London in 1896 the trade had increased till, in 1901, this State forwarded 33,270 cases to Europe. During the period between January 1st and May 15th of this year 12,271 cases (many of which held 2bush.) of apples, pears, and quinces were sent to Broken Hill from Adelaide alone. Besides these many hundred were sent thence from country districts direct. He contended that any relaxation of these regulations would increase the quantity of "wormy" fruit, owing to increased laxity on the part of growers and dealers. We should then either have to send away nearly all the sound fruit, or lose our outside markets. To increase the consumption of apples and pears locally the quality must be maintained. Fruit appealed to the consumer through the eye as well as the palate, and, as he knew from personal experience and investigation, an increased quantity would not be consumed if the supply were largely composed of damaged and worm-infested specimens. The question had taken quite another phase since the

Bureau previously discussed it. Since then the West Australian Government had decided to remove the prohibition on our apples, pears, and quinces, providing they come from clean districts. In many localities we possessed plenty of clean gardens still, and no pains should be spared to secure this trade, and assist those with clean gardens to keep them clean. All the world over in fruit-producing countries the tendency of events graduated in the direction of the views he expounded for the maintenance of an article of high quality, free from insect or fungus attacks. In Tasmania the distribution of codlin-infested fruits was dealt with by law. In many states of the American union and Canada laws existed providing for the compulsory destruction of such fruit. In California the latest session of the Legislature passed a law making it a fineable offence for any one to sell or distribute codlin-moth-infested fruits. Amongst the growers in Victoria the number of those in favor of a law prohibiting the sale of infested fruit was largely increasing. Recently the markets there had been glutted with apples, and inquiries showed that this condition was caused by the large quantities of diseased and wormy fruits being put upon the markets. He contended that in ordinary seasons good sound cooking apples only brought from 1s. to 2s. per case in the local markets, and if the infested fruits were also brought in, the gardener would so reduce the price of good sound fruits that he would only handle more bulk for the same money. He contended it would be more profitable to turn these fruits into pork by feeding them to pigs, or by drying for winter use, or by vinegar or cider-making, or feeding them to cattle, than in putting them into competition with sound fruits. He believed if the regulations were carried out in a proper and thorough manner, by the Government on the one hand and the growers on the other, the quantity of infested fruit would be so reduced that no one would need to seek for special by-ways of utilising it. It was contended that persons were penalised for unwittingly selling infested fruits. He denied such a statement, for no one was prosecuted without very strong evidence of neglectful sorting being apparent. The agitation for the repeal of the law came mostly from growers possessing only a few acres, or even a few trees, in the hills near Adelaide. The larger and more commercial growers were usually cognisant of the importance of restricting this pest, and acted accordingly. In the Clare, Angaston, Wirrabara, and South-Eastern districts meetings had passed resolutions supporting the present stand taken by the department. In the hills near Adelaide, in isolated cases, abundant evidence of what the careful observance of the requirements of the law could do in the reduction of this pest was observable. No doubt much could be done in connection with the work of garden inspection, but it was difficult to get the Government and the public to realise what this meant to the industry. Much could be done yet in elucidating the habits of the pest, but on the whole he believed the precautions outlined in the regulations were feasible and practicable, and founded on the observed habits of the insect. It had been contended that the law had failed absolutely in its object, viz., in stopping the spread of the pest. He contended that such was not the case, as, after sixteen or seventeen years, we still possessed many clean gardens. He believed without the pressure of the law there would not at present have been found a clean apple orchard in bearing in the State; and if it had only retarded the spread of the pest for some years, and could still retard it, good was being accomplished. He asked the members to look at the matter below the regulations, as it had a far-reaching effect. Remove the restriction upon the sale of fruits carrying this pest, and one could not consistently ask owners of infested gardens to kill the pest in their own fruit trees at the back doors, while every fruit the dealer delivered at their front doors contained the same kind of insect. This would be illogical and ridiculous in the extreme. If the local grower were permitted to sell his infested

fruits, the importer must also be allowed to introduce and sell in competition those grown cheaply in other States. This had a bearing upon other insects as well as codlin moth, and should not be settled without very serious consideration.

Mr. HOMBURG was satisfied that the Inspector was doing his best to carry out regulations, which he believed to be for the benefit of the apple growers. The Act itself was, however, unsatisfactory, and the regulations not consistent with the Act. He did not think the Bureau was called upon to take on itself the duty of framing regulations. If the Minister asked them, the members would be pleased to assist in making suggestions, but they were not competent to make regulations. He moved—"That, in the opinion of this Bureau, an amendment of the Vine, Fruit, and Vegetable Protection Act is rendered necessary in consequence of recent decisions by the Judges of the Supreme Court."

Mr. GRASBY seconded the resolution, which was carried, and the Secretary was instructed to forward same to the Hon. Minister.

New Members.

The following gentlemen were approved as members of the undermentioned Branches:—Pyap, Messrs. A. Westbrook, H. G. McGough, and G. Napier, jun.; Clarendon, Mr. W. Raisbeck; Quorn, Mr. Jos Brewster; Angaston, Mr. J. Trescowthick; Morgan, Messrs. A. F. Heinrich and G. Wittwer; Rhine Villa, Mr. T. Edson; Mount Remarkable, Mr. A. S. Marshall; Narridy, Mr. J. Smith; Mylor, Mr. Edwin Hagley; Mount Pleasant, Mr. G. A. Vigar; Davenport, Messrs. F. Julian and T. Totman; Minlaton, Messrs. W. Honner and G. Newbold.

Reports by Branches.

The SECRETARY reported receipt, since previous meeting, of eighty-six reports of Branch meetings.

REPORTS BY BRANCHES.

Albert, June 1.

Present—Messrs. G. Holmes (chair), F. Drogemuller, A. Heinecke, J. Stengert, E. E. Hoffman, W. H. Stengert, W. H. Clarke, H. Albert, C. Setterberg, R. C. Rasmussen, H. L. Smith (Hon. Sec.), and one visitor.

PIGS.—After discussion on the points of the different breeds of pigs, members came to the conclusion that the most profitable pig for them to keep was the Berkshire.

HORSES EATING WHEAT.—Mr. Holmes wished to know if it was safe to give a horse water after it had been eating wheat. [No.—GEN. SEC.]

OFFICERS were thanked and re-elected.

Port Germein, May 4.

Present—Messrs. G. Stone (chair), W. Crittenden, W. Head, H. Kingcome, D. Thomson, P. Hillam, E. McHugh, A. Thomson, J. K. Deer, A. H. Thomas (Hon. Sec.), and one visitor.

EARLY AND LATE FALLOW.—This subject was well discussed, the consensus of opinion being favorable to early fallowing. For killing wild oats shallow cultivation and plenty of working was recommended. Deep ploughing was

not advisable, as at every ploughing fresh seed would be brought near to the surface to germinate.

WATERING HORSES.—Members considered it advisable to water horses before they are fed. The best system, however, where water is available, is to lay it on to the stable yard so that the horses can have a drink when they like; they will drink oftener, but less at a time. When a windmill and tanks are used for raising watering, it would not be much trouble to do this. Members did not consider it safe to water horses when they are very hot, as it would probably bring on colic. Stock can be made to adapt themselves to almost any system of watering.

Clarendon, May 20.

Present—Messrs. J. Pelling (chair), J. Wright, A. Harper, E. Dunmill, A. A. Harper, J. Chapman, J. Juers, W. A. Morphett, and A. L. Morphett (Hon. Sec.).

HAY CROP.—Three questions concerning hay were asked through the question-box and answered. Cape oats, in the opinion of the majority of the members, was the best variety for hay. On new land, the first year after breaking-up, wheat was considered best to grow if soil is light, and oats if soil is heavy. It was advisable to sow wheat even before rain should the ground be ready.

FEEDING HAY TO SHEEP.—Paper read by Mr. Flower at One Tree Hill Branch was discussed. Members were of opinion that it will pay, under the circumstances mentioned, to feed sheep on hay at 30s. per ton; but in this district there was generally such a ready sale for chaff that it would be more profitable to the grower to sell it.

Forest Range, May 30.

Present—Messrs. J. Rowley (chair), G. Monks, A. Green, J. Green, C. Norton, C. Stafford, J. Jennings, A. S. Gunning, W. McLaren, A. Brockoff, W. Cherryman, H. H. Waters (Hon. Sec.), and six visitors.

OFFICERS.—Messrs. J. Rowley, J. Green, and H. H. Waters were elected Chairman, Vice-chairman, and Hon. Secretary, respectively, for ensuing year.

PRUNING OF OLD FRUIT TREES.—Mr. G. Monks read a paper on this subject to the following effect:—

A more correct heading for this paper would be "Pruning fruit trees that have been neglected when young." That ancient proverb, "Train up a child in the way it should go, and when it is old it will not depart from it," will apply just as well to young fruit trees, for if they are neglected then it is impossible to make such trees of the proper shape; therefore, this is the time when the formation and training of all fruit trees should be attended to.

However, I will endeavor to show how those that have not been attended to at the proper time may be brought back as nearly as possible to the ideal shape. The aim should be to make the trees well balanced, to lower them as much as possible, to make them bear fruit and bear it low down in the forks of the trees. The first thing to be done to obtain this result is to take out the centre and main branches, and then always prune downwards and inwards, never upwards and outwards. Always be careful to sever a branch either at the junction with another branch, or, if it be a small one, just immediately above a bud. Do not sever a branch (little or big) any further away from either than can be helped, else the result will be disastrous—the end of the branch will decay. If cut closely and neatly, the end will heal over as growth goes on. Never leave more than one tier of main branches; that is, cut away all the inner ones till this result is obtained, and then your trees will be drawing near to the ideal shape, that is, an inverted umbrella. Never allow limbs to cross over each other. Shorten all main branches to a reachable height, so as to make them stiff and firm against winds and weather. Never leave more main branches than the trees can contain without overcrowding. This of course must be regulated according to size of trees.

I advocate pruning downwards and inwards, because, by doing so, you force the buds which are lying dormant on all the main branches to burst forth and become fruit-producing, thereby making the trees bring forth fruit from the forks upwards. Another good thing attained by pruning inwards is the trees open out, the branches come down lower, and bear much sooner than they otherwise would. Yet another good result will follow, and that is a better sample of fruit. Now, by pruning upwards and outwards the opposite to this will be the result; the fruit buds are forced upwards, and when the trees do bear the fruit is so high that either it cannot be reached properly, or else the trees break down, or winds shake off the fruit. The old idea that the fruit will scorch with the heat of the sun if the centres of trees are cut out is exploded. The fruit on the inside does not scorch; but that on those long branches which are bent down to the ground by an overload frequently scorch very badly.

After having brought the trees as near to the shape aimed at as possible, and forced the dormant buds on the main branches into existence, the fruit spurs can then be developed by summer pruning: and I find, as far as my experience goes, that the best time to break back the laterals to form fruit buds is in the month of March, that is in a well-cultivated orchard and good soil; but with poor cultivation and poor soil the month of February.

Do not think any winter pruning should be done after June, because that will allow the cuts time to become callous before too much frost, and before the sap begins to flow again. I have pruned in May before the leaves have fallen, and think it a very good time, as the foliage shades and shelters to a great extent the cuts made, particularly when large branches are severed.

Now, just a few words about the tools for pruning. It must be patent to all orchardists that those long pruning shears in use in some orchards are not by any means suitable for the purpose, as it is impossible to make a neat severance with them. The only tools required are a saw and a knife, and, if preferred, a small pair of shears. I have never yet seen my ideal of what a pruning saw should be; it ought to be as fine as a tenon saw, so that the cut made will be as clean as possible; but pruning saws are almost as coarse and stiff as pit saws, some with teeth on both edges. What the idea of this is perhaps the manufacturer can tell.

In reply to question, Mr. Monks said if all the main branches or limbs were removed the old stump would, of course, die. He advocated the gradual reduction of the tree. Mr. R. Green entirely agreed with the paper. If the old trees were dealt with as described it would greatly assist in dealing with the codlin moth. Mr. H. Green asked whether a young tree could be grown in the place of an old tree that had been removed. Mr. Monks thought so, provided the old tree were properly grubbed and the ground freshly broken up. He favored cutting back young trees to about 15in. on level ground, and 2ft. on slopes, when planting.

Wandearah, May 27.

Present—Messrs. G. Robertson (chair). W. Munday, J. Wall, E. H. Eagle, R. J. Dennis, E. Jacobs, A. W. Davidson, W. Roberts, C. E. Birks (Hon. Sec.), and two visitors.

LOSSES OF STOCK.—This matter again came in for attention, further losses having occurred. The Chairman read extracts from the *Observer*, dealing with similar matter, which were thought to throw some light on the losses that had occurred in this district. It was thought likely that some of the cattle had died from impaction, brought on by a weakening of the internal organs, caused by eating injurious plants.

SHEEP ON FARMS.—Members recognised the advantage of keeping sheep on farms, but in many cases it has been out of the question during the past few years, feed being so scarce that all hay and straw has been needed for horses and cattle. The Hon. Secretary has a small lot of twenty-five sheep in a two-acre paddock, and is feeding sheaved barley to them. They have been in for a fortnight, and took readily to the change of food in a few days, and are now doing well on it. Five or six small sheaves daily is as much as the sheep will eat up clean.

ENSILAGE.—The Chairman tabled sample of oaten ensilage, of which he has two pits. The sample was of first quality.

Port Pirie, May 25.

Present—Messrs. T. Johns (chair), H. B. Welch, G. M. Wright, T. Gambrell, T. Jose, and T. A. Wilson (Hon. Sec.).

ANTHRAX.—The Hon. Secretary referred to case of anthrax in a human being, and the necessity for investigation as to source of infection.

SHEEP ON FARMS.—This matter was discussed in connection with Mr. Welch's paper, read at previous meeting. The district was considered to be unsuitable for sheep, except upon large holdings, owing to dryness and lack of water and to the ground cutting up so much, causing it to drift, with the consequent loss of grass seeds. Opinions were divided as to sheep cleaning the land. Mr. Flowers' method of feeding chaff to sheep was considered to require a sheltered spot, with a firm and well-grassed soil.

MANURE EXPERIMENTS.—The suggestion that members should experiment with different quantities of manure per acre met with approval, and some of the members are trying such experiments.

Quorn, May 30.

Present—Messrs. R. Thompson, (chair), J. B. Rowe, H. Altmann, C. Patten, W. Toll, and A. F. Noll (Hon. Sec.).

WHEAT FOR HAY.—The Chairman initiated a discussion on the most suitable wheat for hay. As a dealer in chaff he had a good deal of experience of the demands of purchasers. Teamsters always wanted a good green-colored chaff, but at the same time required plenty of grain in it. In the dry Northern areas, if the wheat was left until it had formed a grain, it was generally too dry and white in color. He had thought that it might be advisable to sow an early and a late wheat together, so that they could get both color and grain in the chaff. Members thought it might do when a crop was sown expressly for hay. They thought, however, the color would be all right in good seasons, though, owing to the severity of the seasons lately, hay had suffered in this respect. The Hon. Secretary pointed out that of late years, if a farmer wanted any hay, he had been compelled to cut the crop on the best of the fallow, sown originally for wheat, owing to other land failing to produce any growth worth cutting.

SORE SHOULDERS.—Mr. Altmann initiated discussion on prevention of sore shoulders in horses. Bad fitting of the collar was the cause of soreness. The collars should be well cleaned, and the parts that had hurt the horses well beaten with a hammer. They should then be soaked in water for three or four hours, and put on the horse wet. The collar would then give to the shoulder. He had tried this for several years with success. He would also soak a new collar before putting it on a horse.

FALLOWING WITH SIX HORSES.—Mr. Toll was of opinion that the best way to work the team was two by two, as they draw the plough straight and have the advantage of walking in the furrow. Last season he worked his teams this way, and they seemed to get the work done more easily. In harnessing he put an extra chain between the first two horses, with a swing for the middle pair, which was supported by breast chains, the leaders being attached in the usual way. Members admitted there were advantages in working on the tandem system if the leaders were fast enough and could be made to do their share; but, as a rule, they soon found out that the driver was a long way off, and they loafed, leaving the horses behind to do most of the work. The majority of the members favored working the team abreast, as each had to do a fair share of the pulling, and all were within easy reach of the driver.

Craddock, June 1.

Present—Messrs J. Paterson (chair), J. Turner, B. Garnet, J. H. Iredell, J. H. Lindo (Hon. Sec.), and one visitor.

BREEDING HORSES.—Mr. Paterson asked best way to breed a good roadster. The Hon. Secretary said an active draught mare, of Clydesdale or other large-framed breed, should be mated with a thoroughbred horse, and the female progeny put to a thoroughbred of large proportions. The progeny of this cross would prove good roadsters. A visitor thought a better roadster would result from the mating of a thoroughbred mare with a clean-boned, muscular, medium-sized draught entire. Mr. Garnet asked what was a Hackney horse, and the Hon. Secretary explained that it was a strain that had resulted from continued and careful breeding for special points. Great care in breaking in was also necessary to ensure good paces in saddle work. Members were of opinion that care must be taken in breeding roadsters that one of the parents was purebred.

Koolunga, May 30.

Present—Messrs. T. B. Butcher (chair), J. Button, J. Pengilly, W. T. Cooper, G. Cooper, F. J. Shipway, T. Freeman, J. Butterfield, R. H. Buchanan, J. Sandow, and J. C. Noack (Hon. Sec.).

BEST HORSE FOR FARM WORK.—Mr. G. Cooper read a short paper on this subject. He preferred a good cross-bred horse; a good, upstanding, large-boned horse with strong muscles, clean legs, good weight, strong body, open chest, and small head. The Norman, the Cleveland, the Norfolk Hero, the Rotterdam were all cross-bred horses, but bred on different strains. All were active, walking fast, the legs generally clean, and if they are properly broken are usually good pullers. A cross from a good upstanding blood horse and a well-built good-tempered draught mare was advocated. It was better to breed from a small horse and large mare than *vice versa*. Mr. Pengilly preferred the Clydesdale, especially in hilly or heavy land. It was close set, nuggety, and broad chested. The general opinion was that on plain land the medium heavy clean-legged active horse was best.

Redhill, May 28.

Present—Messrs. R. T. Nicholls (chair), L. R. Wake, W. Stone, R. H. Siviour, H. Darwin, A. E. Ladyman, D. Lithgow, A. A. Robertson, J. N. Lithgow (Hon. Sec.), and one visitor.

HORSES.—Mr. Stone read a paper on "Horses Suitable for Farm Work, and the Treatment of Same." His experience was that a medium-sized horse, squarely built, with plenty of muscle, good hard flat bone, was the most suitable class for farm work. The cannon-bone should not exceed 10in. Sire and dam should be fairly large boned. Shortness was a necessary feature. It was difficult to get a horse too short in the leg. This stamp of horse will eat less food and do more work than most horses usually kept. Horses should be well fed, groomed, and attended to. Properly treated, their pace and power of endurance will increase. He believed in feeding principally on chaffed hay with crushed wheat, and perhaps a little cocky chaff. If kept in the stable all night he preferred loose hay (not too coarse) for the evening meal. Change of food occasionally was beneficial. To keep the shoulders sound the collar must fit well. Keep the shoulders and the collar well filled. He found it a good plan to soak a new collar in water before putting it on, as it is then more likely to

shape itself to the horse's shoulders and neck. Foals should be well fed until they are twelve months old, and then left to take their chance in the paddocks. They should not be broken in until between 3 and 4 years old. Always keep them in good condition. The horse was a most useful and valuable animal on the farm, and was well worthy of all the care and attention they could give it. Most of the members agreed with the class of horse advocated by Mr. Stone, although one member favored a lighter horse—about three-quarter bred. It was agreed that horses should always be well fed, chaffed hay with corn being mostly favored. Some fed on long hay and wheaten chaff mixed with pollard. All agreed that it would be a good plan to grow a small patch of Cape oats each season for the horses.

Wilmington, June 1.

Present—Messrs. J. Hutchens (chair), W. Slee, A. Maslin, H. Noll, F. Bauer, J. Zimmermann, J. Schuppan, J. McLeod, J. A. G. Lauterbach, R. G. S. Payne (Hon. Sec.), and a large attendance of visitors.

EXPERIMENTS.—Mr. Slee stated that he had three one-acre plots, side by side which he had sown, and manured with 2cwt.s., $1\frac{1}{2}$ cwt.s., and 120lbs. of superphosphate. Mr. Schuppan said he had five one-acre plots sown with quantities of super. varying from $\frac{1}{2}$ cwt. up to $1\frac{1}{2}$ cwt.s.

COLT-BREAKING.—Mr. J. A. G. Lauterbach gave a practical exhibition of colt-breaking in the sale yards attached to the Beautiful Valley Hotel. For the purpose a large 5-year-old mare, from Mr. Slee's run, was brought in. She had never before been handled, and was very obstinate and sulky. Mr. Lauterbach had an assistant at first, and tried his usual practice of gently approaching the animal with a long light bamboo, with which he rubbed her back, intending to catch her by the mane; but, as darkness was approaching, he gave this up and lassoed her. Directly he caught her he mounted her back without saddle or bridle, and maintained his seat until she became quiet. Then he dismounted, with some assistance put on a saddle and bridle, and rode round the outskirts of the town for a time, until she became so quiet that a young son of Mr. Slee's rode her a distance of three miles to his home. She has since been ridden several times, and has not given the slightest trouble. Mr. Lauterbach said this was the most determined animal he had ever handled.

Nantawarra, May 31.

Present—Messrs. J. Nicholls (chair), H. J. Spencer, R. Uppill, E. J. Herbert, G. Belling, T. Dixon, jun. (Hon. Sec.), and one visitor.

DRILLING.—In answer to question as to depth at which seed-drill should be set, most members favored settings as shallow as is possible, so long as the seed is covered.

AGRONOMY.—Mr. H. J. Spencer read a lengthy essay, to the following effect:—

The word "Agronomy" represents every operation connected with agriculture, horticulture, floriculture, arboriculture, dairying, pastoral pursuits, and everything else connected with the cultivation and use of the soil, and is too large a subject to be dealt with completely in one short paper.

Naturally, some localities are well suited for some of those pursuits and not for others. For instance, the Mount Lofly Ranges are well suited for the growth of fruits and vegetables, timber trees, &c., and a knowledge of all the necessary operations connected with those industries would be more useful than of pastoral pursuits and growth of cereals.

Where climatic conditions are favorable, and plenty of water is available, many varieties of crops, &c., can be raised, and products developed, that cannot be secured in the arid districts of this State.

In regard to timber tree-planting, failures often result from pursuit of wrong methods rather than to soil or climate. In digging holes, especially in heavy clay soils, it is usual to make them 2ft. square by about 2½ft. deep. This method is fatal to the trees, and costs a deal of labor. The roots of the tree follow the line of least resistance, do not penetrate the walls of the holes, and consequently become "potbound." In winter the water collects in the hole, drowns the roots, and kills the tree; or, in summer, the soil shrinks together in the holes, leaves a big opening next to the walls, and the roots perish from heat and drought. The proper method is to plough the land deeply early in the season, so that the soil may settle down and become mellowed by atmospheric influences; plant the trees, and always loosen up the surface directly it gets caked through rainfall or any other cause. The best trees are those raised in the neighborhood of where they are to be planted. The following method of raising forest trees from seeds has been satisfactory:—De-solder a lot of jam tins, by placing them on the fire; reject the top and bottom pieces. Place the tins in a box as close as they will stand. The sides of the box should be a little higher than the tins. Fill the tins within ¼in. of the top with good mould, and water well to settle it. Next day drop a seed or two in each tin, and cover lightly with finely-sifted soil. The seed should be sown about February, whilst the soil and air is warm. The surface soil should not be allowed to become caked, and it is well to cover the box with a bran bag until the young plants come up. This should occur in about a week or ten days; then remove the bag. A 6d. packet of sugar gum seed will furnish a good number of trees. July and August are recommended for planting of sugar gums and many other forest trees, as they will then usually escape injury from winter night-frosts; but if no summer and autumn rains should fall, the trees may be killed by drought if not watered by hand. Much good, however, can be done by frequent surface-stirring near the trees. It has been recommended, and with many good reasons, that earlier planting would be beneficial, because the roots will not have become so much cramped, the trees will have the benefit of the winter rains, and most probably some simple means could be adopted to protect them against winter night-frosts.

Trees beautify the landscape, relieve the eye when herbage is dry through heat, provide shelter for stock all the year round, and in time will furnish firewood and timber. Trees are beneficial to health, and, in some localities—notably swamps—render localities habitable where previously no one could safely live. Australian eucalypts have been largely planted in India, Mauritius, Algeria, Italy, and America, with these ends in view.

A great many countries have suffered from an unwise denudation of forest slopes. Through the hillsides being cleared it allowed the water falling in rain to flow quickly away, and in some places terrible floods have occurred in the low-lying country, where floods were unknown. There is good authority for stating that many famines have been brought about in India and parts of China from this cause. Efforts are now being made by systematic tree-planting and conservation of forests, to prevent similar calamities in the future. A great traveller wrote as follows:—

"Nothing is more certain than that forests and tracts of brushwood not only prevent the evaporation of moisture by protecting the surface of the earth from the sun's rays, but they serve to retain the light clouds, which otherwise would be dissipated, until they attain sufficient consistency to descend in rain and refreshing mists. A hillside deprived of the forest, whose foliage acted as a parasol to the ground, and whose roots served to retain the vegetable soil which was formed by its decay, very soon loses its power of generating vegetable life at all. The rich mould gets washed away by winter rains into the valleys; in the summer months the sand is blown on top of this; succeeding rains carry down stones and gravel, till very soon all the most fertile portions of the soil disappear, leaving a residuum which is only capable of supporting vegetation when it becomes fertilised by an exceptional amount of moisture, which, as time progresses, must become rare and more rare, like the efforts of the spendthrift to live off income and spending every year a portion of his capital."

People in England enjoy a moist climate, and have no fear of famine; therefore they do not take so much interest in forestry as do the continental nations. Perhaps the feeling is hereditary in the British descendants in Australia, so far as sylviculture is concerned. There is little doubt that neglect to conserve lately existing forest and scrub, and to plant trees extensively, has had a detrimental effect. Drifting sand and soil has been somewhat extensive and increasing during the past four or five years, and there is evidence apparently of a decrease in the annual average rainfall. What is to be done in this matter? We do not know the value of our blessings until the time of adversity; and one great blessing is the presence of plenty of trees. The downfall of Spain has been attributed to its denudation of timber, thus converting good fertile land into barren plains. The position must be considered, in reference to coming generations. In the past our Government has been neglectful in regard to forest legislation, but it would be true statesmanship to consider welfare of future generations in this respect. In some countries the forest laws are very strict, and where a man receives permission, after much negotiation, to cut down a tree on public property, he has to plant and rear a dozen young trees to replace it. In another country the Government gives a bonus for every tree planted and maintained for ten years. Could not something of the kind be done in Australia?

Mr. Belling thought it would be advantageous to plant trees earlier than usual in dry districts. Mr. Sleep found that his planted trees made poor growth. All members recommend sugar gums. Hon. Secretary said so long as his sugar gums were small enough to allow of the scarifier being worked between them they did well; but since the scarifier had ceased to work, on account of the roots, the trees had done badly. All members agreed that tree-planting should be continued.

Swan Reach, June 1.

Present—Messrs. J. L. Baker (chair), F. Fischer, W. Hecker, R. Harris, P. A. Beck, and one visitor.

OFFICERS.—Messrs. P. A. Beck, P. Hasse, and J. L. Baker were elected Chairman, Vice-chairman, and Hon. Secretary, respectively, for ensuing year; the retiring officers being thanked for their services.

COMMONAGE.—Mr. Beck reported there was splendid feed for stock about Eastern, Elizabeth, and other wells, and Walker's dam; but unfortunately the wells had been allowed to go to ruin, and it was impossible to procure water for stock. It was thought that the Government should be asked to repair these wells, as feed was very scarce in the neighborhood of the Murray and surrounding districts, and farmers could avail themselves of the feed about the wells and dam if the water were available.

Millicent, June 5.

Present—All the members; also members of the "Home Circle" (wives, sons, and daughters of members and friends), and a roomful of visitors.

Annual Meeting.

This being the annual meeting of the Branch the members, in conjunction with the Home Circle, arranged for a show of produce and home industries, addresses by specialists, combined with music and a bountiful tea.

Exhibits.

Tables down the centre of the hall and alongside the walls were loaded with vegetables of many kinds, pumpkins, melons, fodder plants, and various kinds of fruit. The ladies of the Home Circle staged jams, sauces, pickles, dried and preserved fruits, confectionery, pastry, bread, flowers, and a multitude of interesting and useful articles.

Possibilities in the Poultry Business.

Mr. H. Holzgreffe, J. P., Chairman of the Branch, presided, and called upon Mr. A. Molineux, F.L.S., General Secretary of the Agricultural Bureau, who read the following paper, which was written for the occasion by Mr. D. F. Laurie, who at one time was Government Lecturer on Poultry:—

Introductory Remarks. The poultry industry has not received the attention that its importance deserves. Until recently the average man has despised poultry, and regarded attendance on the birds as being worthy only of the attention of the womenfolk. Perhaps some of these masculines have seen fit to modify their opinions of late. At any rate, the spread of precise information has awakened an interest which is increasing in this State, while in Victoria, New Zealand, Tasmania, and New South Wales the export trade already has reached respectable dimensions.

The Queensland Government has appointed an expert, and has purchased a number of high-class birds of various approved breeds; but the industry is still in its infancy.

New South Wales has, through its Board of Exports (a semi-Government institution), done much to open up a large export trade. They have a first-class expert, and a vigorous export

trade is rapidly increasing, some 50,000 head of poultry and numerous packages of eggs having been sent to South Africa and London last year.

Victoria took an easy lead in starting the export trade. For a time it languished, but now it is flourishing. For the year from January till April 30 the exports numbered 23,406 head, including 1,500 for West Australia, the balance going to South Africa. The gross value was £4,212. Returns for table poultry and eggs shipped to London from Melbourne were pleasing, and realised most satisfactory price.

Tasmania has appointed an expert, and has imported a standard collection of various breeds, and intends to make a big bid to establish the export trade.

New Zealand has appointed four experts, one each at Wellington, Auckland, Christchurch, and Dunedin, and has also imported a large collection of standard birds.

South Australia exports annually over £50,000 worth of eggs and a few birds. There was, five years ago, great promise for our export trade; but things have not prospered, and we must awaken. Our geographical position and unequalled climate, especially in the South-East, are great factors in probable success. We must follow in the steps of the other States if we cannot strike an independent course of our own.

Who should keep poultry?—Every farmer, every orchardist, most old people, and those whose physical infirmities prevent them engaging in the ordinary laborious pursuits of life.

Markets.—There is a fair local market for first-class table birds in Adelaide, while the London market can take an unlimited number of table birds of the very best quality, besides all the fresh eggs we can produce. As regards the British market, it is essential that birds of the best possible quality only shall be sent. Unless this is done there will be little return from the shipment. The South African market is largely exploited by Victoria and New South Wales; as regards South Australia, there appears to be a woeful lack of enterprise somewhere.

England's Imports.—In case there should be any misapprehension with regard to there being a market for our poultry and eggs, the following figures will dispel the error:—The total imports of eggs and game in 1852 were valued at £250,000. For the year 1900 the total value of imports of those articles was £5,416,468, made up of £5,406,141 for eggs, and £1,010,327 for game and poultry. The total increase over the year 1899 was £586,782, and for the period from 1891 to 1900 the increase was £2,481,971. Doubtless in the near future both West Australia and South Africa will be self-supplying in the matters of egg and poultry requirements.

Best Breeds.—Those who seriously contemplate entering upon the poultry industry must observe that breeding for egg production, and rearing fowls for table purposes, are distinct branches of the business.

Where table birds are wanted, it is needful to have fowls that will produce sufficient eggs for hatching purposes, and they must be of some breed that will fill all requirements as to weight, color, and quality of the flesh, as well as early maturity and economic fattening propensities.

If fowls are to be kept for egg production only, then the breeds must be selected with that end in view. There are breeds that are noted for the number of eggs the hens usually lay when well looked after. Special feeding is resorted to to stimulate that production; but such feeding would not be proper when breeding for table fowls. It is absolutely necessary to select breeds already prominent as layers, and from their progeny continually select the best layers to furnish eggs for hatching purposes, and thus establish a flock with high average laying powers.

Best Breeds for Table Birds.—*Fowls.*—Pure breeds required, the Dorking and the Houdan. *Crosses.*—Indian Game with Dorking, Houdan, Langshan, Orpington, Wyandotte.

Ducks.—A cross between the Pekin duck and Aylesbury drake is to be recommended for early maturity, making size and constitution.

Geese.—These will not pay for export unless the goslings average 15lbs. each, and are quite fat.

Turkeys.—These must be very large and young. Cockerels of 15lbs. and upwards, and pullets not less than 12lbs., are suitable if in good condition. Such weights can only be obtained by breeding from mature American Bronze turkeys.

Layers.—There are certain breeds that are famous as layers, and if first-class specimens are obtained for a start, and the progeny culled carefully, a fine strain of great layers will soon be developed. I value the following breeds, in the order named:—Minorcas, Leghorns, Andalusians, Anconas, Hamburgs. Of course different strains vary. The superior size of Minorcas recommends that breed for general adoption. Then there are—

All-Round Fowls, or gone al purpose breeds, of which the Wyandottes are the first in order of merit, followed by the Orpingtons, Langshans, Plymouth Rocks, and Scotch Greys. These are all good winter layers; in fact, the Wyandotte is a regular farmer's fowl, and it is the best suited for running in the orchard, because the birds are quiet and not much addicted to flying.

Food.—All food given to fowls should be of the best quality, and in sufficient quantity to satisfy requirements without wasting any. Wheat, barley, oats, whole or crushed, and bran

or pollard for soft food will fill the bill. Crushed grain should be fresh, for if stale it is apt to produce trouble.

Time does not permit of full particulars as to cost of feeding, but experiments and observations conducted by many poultry breeders in this and other Australian States show that chickens can be reared to sixteen weeks old at a cost of about 8d. each, when all food is purchased at full rate; the pullets will then begin to lay, and the cockerels will sell at from 1s. 6d. upwards, according to size and quality, in the Adelaide markets. Eggs should not cost more than 3d. per dozen to produce.

Preserving Eggs.—Water-glass (a silicate of soda) is now very much used as a preservative of eggs, gives much satisfaction, and entails no trouble. Any cask, tub, or tank, that will hold the solution will do. The eggs for preserving are all the better if laid by hens that have not been running with the rooster. Water-glass differs in density, according to sample, and, when purchasing, the vendor should be required to state what is the strength. Eggs so preserved will keep for an indefinite period, and when it is desired to sell them they only need to be taken out of the solution, drained, dried, and packed in the usual way. After one trial egg-preserving will become an annual practice.

[A pint of water-glass will suffice for 20pts. of water, which should first be boiled and then allowed to cool before adding the water glass.—HON. SEC.]

Development of the Danish Egg Trade.

The General Secretary read an extract on this subject, which was published in the June issue of the *Journal of Agriculture*, and a lively discussion followed; after which most of the members and visitors enjoyed an excellent provided by the ladies of the "Home Circle."

Wool-Classing.

At the commencement of the evening social meeting, Mr. Geo. Jeffrey, Wool Instructor, School of Mines, gave a short address on "Wool-Classing." He strongly advocated systematic wool-classing, because they could not secure best prices without systematic separation of the different qualities of that article. This was more necessary than ever this year, because fine wool realised a good price, whilst coarse wool was lower than ever. He would not enlarge upon the subject, because he had a large class of students at Millicent, and could better instruct at the wool table than on the platform at a social meeting.

Cottage Gardening.

Mr. Geo. Quinn, Horticultural Instructor, gave a short address upon this subject. He dealt with the essential points in connection with preparing the soil, designing and laying out the ornamental as well as useful portions of a small garden suited to the requirements of the farmer or cottager. Useful hints respecting the methods of propagating plants by means of seedlings, cuttings, and grafts were given. The pruning of shrubs, roses, and fruit trees was touched upon in a general way, and many of the initial difficulties which confront the amateur were explained.

Interspersed with the above addresses were several very creditable vocal and instrumental selections by young ladies and gentlemen, and an absurd "reading" by a schoolmaster.

Finale.

The Chairman remarked upon the enjoyable nature of the annual social meetings. The Branches of the Bureau were doing good work. He was sure the general planting of fruit trees, and the establishment of gardens attached to farms, would make rural life more pleasant and attractive. He moved a hearty vote of thanks to those who had prepared addresses, rendered music, provided refreshments, and in other ways contributed to the success of the meeting. This was carried by acclamation.

The General Secretary said there were a few persons who adversely criticised the Agricultural Bureau, and said the work done was not worth the expense.

But it had added, he believed, quite two millions of pounds annually to the products of South Australia. Before the advent of the Bureau there was not one co-operative butter factory in the colony; but, soon after the Bureau began to advocate co-operation in butter-making, we had thirty-two factories at work, and that made it possible to export our butter. This led to cool storage at Port Adelaide, followed by the Export Produce Dépôt. The adoption of spraying in the Hills District alone, at the instance of the Bureau, had saved considerably over £20,000 a year, and the use of artificial fertilisers had doubled the crops where used. The Bureau now consisted of 1,400 members—fine fellows, brainy men—who were reading papers and doing practical work all over the State. Those who said they did not know what the Bureau had done showed crass ignorance. He moved a vote of thanks to the chair, which was carried with applause.

Eudunda, June 3.

Present—Messrs. H. Martin (chair), C. Wainwright, H. Hage, J. A. Kluske, E. T. Kunoth, J. A. Pfitzner, and W. H. Marshall (Hon. Sec.).

BULL.—Mr. Pfitzner reported on progress made for purchase of a dairy bull for district.

THE SEASON—Several farmers mentioned that, although rain was late this year, they had known seasons when rain had been later, and still good crops had been harvested. [Since this meeting over 1 in. of rain has been registered at the local post office.—HON. SEC.]

Robertstown, June 3.

Present—Messrs. N. Westphalen (chair), H. Rohde, W. Kotz, W. Farley, J. E. Milde, and S. Carter (Hon. Sec.).

LESSONS FROM DROUGHT.—Mr. Westphalen said some people had not learned from past experiences with drought to lay in stores of fodder during seasons of plenty. There were many who had not enough hay to carry their stock on to the next season. Straw could be chaffed for horse-feed, and ensilage should receive the attention of farmers. Mr. Farley said straw is bad for horses, and they will die on it. He had not tried ensilage, and thought it required more labor than it was worth. He knew that Mr. Pearce had ensiled "geranium," and was highly pleased with the result; but next year his paddocks were bare, because no seed had been left on the ground. Mr. Westphalen said chaffed straw would not hurt the horses if the knots were winnowed out. Wild oats might be advantageously used for ensilage, as many paddocks were covered with them. [Mr. Farley does not speak from experience with ensilage. Very many thousands of farmers have used silage for the past thirty years, and they are well satisfied with the profit of the practice.—GEN. SEC.]

Maitland, June 1.

Present—Messrs. J. N. Smith (chair), T. Bowman, C. F. G. Heinrich, H. R. Wundersitz, J. Kelly, W. Wilson, W. Bowey, G. Nicholls (Hon. Sec.), and one visitor.

CLEANING RESERVOIRS.—Mr. J. Kelly read the following paper:—

An easy, quick, and inexpensive way of taking out the mud is required. I have tried various ways with the scoop, but when the bed is soft you cannot do much with that. Then I tried a triangle of three long poles with a platform nearly at the top, but the difficulty was

to get poles long enough, and it required a long trough if the dam was large, and that was very expensive. Next I tried a half a 200-gallon tank on wheels, with a trap door in the bottom. The difficulty was in going into the dam, as it would run on the horses, also it had to be filled with buckets, which was hard work. I am now using a half 200-gallon tank, but can use the whole one if I please, as it will save putting a door on the half. I put it on two pieces of wood for a slide, cut the front out and make it into a slide door, with two pieces of wood, one on each side of the front, so as to fix a lever on one and a fork on the other to lift it when going into the dam, and as soon as full let the door down. One has to stand on the front to keep it in, and also to push the dry dirt in with the foot. When it gets to the top of the bank lift the door, and most of the dirt will run out if soft enough: if not, have a scraper handy. When clean, let the door down to prevent the mud going in again. The horses need not go into the mud in the dam if the chain is long enough. The objection to this plan is that the horses have to go through the mud that is taken out. In placing the tank on the slide raise the back of the tank 3 in. or 4 in. A piece of flat iron across the front and back, instead of wood, is desirable to prevent the mud sticking to the bottom. We have taken 2 ft. out of a dam in half a day. I think we averaged about 90 galls. each time. The softer the mud the better. It only requires two men to work it—the driver and one to look after the mud cart.

TREE PLANTING.—After discussion, it was decided that each member desirous to establish forest trees should make separate application for as many as he requires.

Morgan, June 1.

Present—Messrs. R. Windebank (chair.), H. Hahn, R. Wohling, G. Ruediger, W. Plummer, J. Bruhn, and E. French (Hon. Sec.).

NEW INDUSTRIES.—Mr. W. G. F. Plummer mentioned the fact that considerable quantities of pickles, herbs, and numerous other articles were imported, but which could be grown and manufactured in this State, and suggested that an effort should be made to do away with that anomaly. He also requested members to consider the possibility of establishing a creamery. After discussion, members considered that nothing could be done without the aid of irrigation.

Renmark, May 30.

Present—Messrs. E. Taylor (chair.), C. Rose, W. Waters, H. Olorenshaw, F. Cole, and J. A. Forde (Hon. Sec.).

LEMON CURING.—Mr. F. Cole read the following paper:—

At this season of the year a few words on the curing and packing of lemons may be appropriate. Great care should be exercised in the picking and handling of the fruit intended for storing. Most growers here seem to be very careless in handling the fruit while picking. I have constantly seen people picking lemons on one side of the tree and throwing them into boxes or kerosene tins on the opposite side, thus bruising them considerably. How can fruit treated thus keep for six or seven months, as we must do to get a payable price? A little care at the time of picking and storing will amply repay the grower, as one lemon turning bad in the sweat box will affect five or six others around it; thus a considerable amount of loss will be sustained through the bruising of the fruit whilst picking. The general method of curing, and which seems to be the best, is the packing of the fruit in sweat boxes in layers with paper between each layer, or, better still, trays if procurable. They should be stored in a cool dry place. To get such a storing house seems to be the difficulty here owing to the great heat of the summer, through part of which the lemons have to be kept. I might here describe a cheap and cool building to store in. Make a good roomy shed of pug or peasey walls, 1 ft. thick, with several good ventilators at the top of the walls. When the walls are finished, cover with split logs or any spare timber, over which put a good layer of pug, then cover with iron to keep out the weather. It would be an improvement to cover with boughs to keep the sun off in hot weather. A good plan to ensure good ventilation and to keep the house cool is to dig a tunnel about 2 ft. or 3 ft. below the surface leading into the store house. On the outside end of the tunnel erect a cowl or windsail. This will ensure a constant circulation of air through the house. The sweat boxes should be kept off the ground so as to allow the air to get underneath. They should be stacked in tiers, leaving a space of 18 in. or so between each tier so as to allow of an examination of the fruit from time to time: you will then know

when to dispose of the fruit to the best advantage. Cleats of wood should be put between each box, so as to allow the hand to go through and thus examine the fruit without unstacking the tiers.

The method of packing fruit in South Australia is very much inferior to that used in Spain and Italy. I speak from experience on this point, having been connected with the wholesale fruit trade in London for nearly six years. As regards lemons they come into the market in cases containing 360 and 420; those from Malaga, in Spain, and Messina are packed 360 in a case, and according to the size of the fruit the case is made, so we get 360 small, 360 large, and 360 extra large; so there are three different sizes of cases, which is very convenient in packing, as the packer knows when he has filled his case he has the proper number of lemons. From Naples they are packed in 420 cases and after the same style as the Messina fruit. The case is first lined with tissue paper and the fruit nicely packed in layers, and on their ends, slightly leaning to the one side, the top layer is generally wrapped in colored papers, which greatly improves the appearance of the case. The great drawback to the one size case for all sizes of fruit is that they cannot be packed properly; some are pressed up tight to the side of the case, or some are loose, and the shifting of the case in transit damages the fruit. I cannot see why we could not have the three different size cases, made to fit a certain number of fruit; the packing would be done much better and quicker and no mistakes as regards number in case, the case when opened on view in the market or shop, whichever it may be, would have a presentable appearance, and not the jumbled up mess that our fruit now presents to the would-be purchaser. I think there is great room for improvement in our packing, especially the citrus fruits—it would pay better in the long run to pack better, and make our fruit more attractive—it would, therefore, be in greater demand.

Some of the members never sweat their lemons, and have had good results.

Johnsburg, June 1.

Present—Messrs. G. H. Dunn (chair), L. Chalmers, T. Potter, W. Buchanan, and W. McRitchie.

HORSE-BREEDING.—Mr. Buchanan read a paper on this subject, and after short discussion it was decided, owing to small attendance, to hold the paper over.

SHEEP ON FARMS.—A discussion took place on this subject. Members were of opinion that it was not advisable to keep sheep on virgin land in this locality unless on large holdings, as they eat the bush and shrubs down too close; the result being that, with their dry summers, the vegetation is soon destroyed, leaving the surface soil exposed to the prevailing winds, which remove the best portion of the surface soils. In average seasons a few sheep could be kept with advantage in the cultivation paddocks. They would eat up the stubbles and help to keep down the weeds, besides being a source of profit to the farmer, and supplying meat for the household.

Holder, June 1.

Present—Messrs J. Rowe (chair), C. H. Perry, H. Tuck, F. Starr, E. Jaeschke, F. G. Rogers, H. Blizard, J. Green, H. Vaughan, J. Jones, J. J. Odgers (Hon. Sec.), and one visitor.

SEED AND FERTILISER DRILLS.—A discussion took place on the merits of the seed and fertiliser drills. A "Superior" drill has been used in this locality. Members considered that it needed a chain harrow after it, and could not see any great advantage, except that the seed and manure were sown evenly together.

TRANSPLANTING FRUIT TREES.—Mr. Rogers asked whether a 4-year-old tree would need to be cut hard back if it were transplanted. Mr. Vaughan would cut at least two years' growth off, as many of the roots would be removed, and it would be necessary to restore the balance between the root growth and the foliage. Mr. Rowe considered it better to plant a fresh tree rather than shift one 4 years old.

Caltowie, June 4.

Present—Messrs. A. Kerr (chair), L. Graham, J. Noonan, J. G. Lehmann, N. E. Hewett, A. McDonald (Hon. Sec.), and three visitors.

ANNUAL CONFERENCE.—All members favor holding the Annual Conference of Northern Branches at Gladstone.

IMPACTION.—In answer to a question, a member was informed that the treatment recommended for “dry bible,” or impaction of the omasum, was published in the May number of the *Journal of Agriculture*. [Every member of the Bureau receives a free copy of the *Journal*, and, if each would only read it, he might not have to complain that he had “never heard” of certain matters.—GEN. SEC.]

COMPLAINTS.—Some members made complaints concerning certain Government officials. [It would be the correct thing to write to the head of the Department concerned. The editor cannot be expected to publish statements which most probably are founded upon misconceptions.—GEN. SEC.]

STRANGLES.—Mr. Noonan said a disease similar to strangles is prevalent amongst horses. Members said it affects old and young horses. The Chairman said the animals ought to be blistered directly the symptoms appear.

Rhine Villa, June 1.

Present—Messrs. A. Payne (chair), W. Farey, H. Mickan, F. Payne, W. Start, A. Lewis, G. A. W. Schick (Hon. Sec.), and two visitors.

WHAT IS A WELL-CONDUCTED FARM?—A discussion has been conducted, and will be continued, upon the question of what constitutes a well conducted farm, and the following principles have already been advanced:—Order and neatness; care of implements and machinery; a place for everything, and everything in its place; provision and storage of feed for stock, with economy in its use; proper use of land; and importance of keeping sheep.

EXHIBITS.—By Mr. Edson, large pie-melons, grown by himself. By the Hon. Secretary, seeds of skinless peas, broad leaf mustard, and tree lucern, for distribution.

Forster, May 30.

Present—Messrs. J. Retallack (chair), F. Johns, W. Johns, John Johns, C. Bolt, J. Childs, A. Schenscher, J. Sears, E. Schenscher (Hon. Sec.), and seven visitors.

OFFICERS—Mr. J. Retallack elected Chairman, Mr. J. Childs Vice-Chairman, and the Hon. Secretary re-elected.

SHEEP.—Members are agreed that sheep should be kept on the farm where possible, as they clear the land from weeds, add to the revenues from the farm, and save expenditure on butcher's meat. Mr. Bolt thought sheep could be kept on scrub lands, as they would live on the young growth of bushes when grass is scarce. He did not think it would pay to feed them on hay chaff when it is worth £3 per ton. A member thought Mr. Flower, of Onetree Hill, rather under-estimates the appetite of sheep. He had given a good armful of hay to two sheep, which they soon ate and were at once looking round for more.

FARMING.—Mr. J. Childs read the following paper:—

I would fallow as early as possible, and work the fallow when the land is in a suitable condition, as it is difficult to crop much grassy land if the rain is late to start the grass. I would not sow the fallow until the rain came, even if it were July, as that would save the grain from malting with light rain, or becoming uncovered with wind and destroyed by vermin. This would probably be a check against takeall. Where takeall is bad sow oats, which could be

used for fodder for stock, as I believe that much of the mortality in stock would be prevented if we could give the animals a little good food each day when the food outside is of a poor quality.

ANNUAL REPORT.—Twelve meetings have been holden, with an average attendance of nine members. Five practical papers have been read, and many subjects discussed.

Petersburg, June 1.

Present—Messrs. W. Miller (chair), E. Palmer, J. M. Cadzow, H. Earle, S. Bottrill, J. Wilson (Hon. Sec.), and seven visitors.

THE PINNAROO COUNTRY.—Mr. Miller, J.P., gave a lot of particulars concerning his recent visit, in company with a Parliamentary party, to the Pinnaroo country, in the so-called Ninety-Mile Desert. The rainfall for 1894 had been 26in., and, in 1900, 15·82in. was registered. It was estimated that, with the use of fertilisers, 500,000 acres could be profitably occupied. There were not many rabbits, but wild dogs were numerous, therefore sheep would require protection. Water has to be obtained from deep wells, which have to be timbered at considerable cost. There were soakages in several places. Scrub is prevalent, grass very scarce, and not much open country. A light line of railway over level country, with no gullies or creek to cross, could be constructed for about £2,000 per mile, and this would accommodate a lot of traffic also on the Victorian side of the Border. He believed this country was the best the Government now had open for agricultural occupation.

Mount Remarkable, May 30.

Present—Messrs. C. E. Jorgensen (chair), T. H. Casley, T. Yates, T. J. Spratt, W. Morgan, J. B. Morrell, W. Lange, and J. O'Connell (Hon. Sec.).

WATERING HORSES.—Mr. Casley would rest the horses for a little after leaving off work, and let them eat a little before giving them water. Messrs. Lange, Morgan, and Spratt would give them water at once after taking off the harness, as they will not eat when thirsty. Mr. Jorgensen allowed his horses to drink as they desired from the open troughs in the yard, and did not think it hurt them to drink whilst they were hot. Mr. Casley mixes about 2lbs. salt with 50lbs. wood ashes, and gives each horse two handfuls once a week, as a kind of condition powder. He got the idea from a newspaper some years ago, and found it kept them strong, sleek, and healthy.

SORE SHOULDERS.—Mr. Casley finds a salve made with flower of sulphur and salad oil a good dressing for sore shoulders. Mr. Lange uses sulphur and hog's lard. [Char an old boot until it will pulverise into an impalpable powder; mix that with tallow, and apply.—GEN. SEC.]

Mundoora, May 31.

Present—Messrs. R. Harris (chair), T. Watt, J. Loveridge, D. Owens, J. Blake, W. Aitchison, H. Haines, H. Torr, D. Smith, C. Button, W. J. Shearer, J. J. Vanstone, W. D. Tonkin, W. Mitchell, A. E. Gardiner (Hon. Sec.), and two visitors.

EXPERIMENT.—One of the visitors said he had drilled in a piece crosswise, which he cut for hay, the result being 3cwt. per acre more than the other portion of crop. The quantity of seed used each way was half a bushel, or 1bush. when completed, with 50lbs. of fertiliser, or 100lbs. when completed.

NEXT CONFERENCE.—This Branch favors the holding of the next annual Conference of Northern Branches at Crystal Brook.

IMPACTION.—The Chairman reported that deaths of cattle that have been attributed to impaction may have been caused by their eating a poisonous weed, specimens of which he promised to bring on to next meeting. He had lost a pet sheep, which had been seen eating some of the weed mentioned. Some members thought that the bones of animals dying from poisoning might prove to be injurious to other animals chewing them. Two members recommended change of pasture to prevent "dry bible," or impaction of the omasum.

WATERING HORSES.—Members are all of the opinion that the best time to water horses is after removing the harness, and before feeding; but never water after feeding. A visitor said he once lost a valuable horse through allowing him to drink freely whilst warm. Mr. Watt said allowing a horse when warm to walk into cold water does more harm than drinking.

WALLAROO SUPERPHOSPHATE.—Mr. Vanstone tabled sample of super., manufactured from imported mineral phosphate at the Wallaroo Smelting Works, which appeared to be good, but should be ground finer.

Port Broughton, May 27.

Present—Messrs. W. R. Whittaker (chair), E. Dalby, B. Excell, Jas. Bates, G. E. Pattingale, and Jas. Barclay (Hon. Sec.).

NORTHERN CONFERENCE.—Members favored holding next year's Conference at Crystal Brook, instead of Gladstone.

STUBBLE-BURNING.—A discussion on this subject took place, most of the members favoring ploughing the stubble in when fallowing.

BRANCH SHOW.—Members did not favor holding a Bureau show this year.

Tatiara, June 27.

Present—Mr. F. Smith (chair), R. Scown, R. Penny, H. Killmier, and T. Stanton (Hon. Sec.).

STOCK TRAIN.—Members agree with Lucindale Branch in urging the Traffic Manager of the railways to run the special stock train on Tuesdays, instead of Mondays.

PRUNING LESSON.—On Monday, June 4, through arrangement made with the Branch by the General Secretary, Mr. George Quinn, Horticultural Instructor, gave a practical illustration of the art of pruning fruit trees, in Mr. F. Smith's orchard. There was a small attendance of persons owning orchards in the district, and these expressed their indebtedness to the lecturer for the useful knowledge imparted by him. After the demonstration Mr. and Mrs. Smith entertained the party with solid and appetising refreshments.

Mallala, June 13.

Present.—Messrs. G. Marshman (chair), H. B. Moody, A. F. Wilson, T. Nevin, Hon. R. Butler, F. M. Worden, S. Temby, M. H. East, W. Temby, Jas. Churches, J. McCabe, A. Moody, W. R. Stephenson (Hon. Sec.), and one visitor.

MEDEA WHEAT.—Mr. H. B. Moody wished to know why Medea wheat is rust-resistant. [Because the shaft is well stocked and the straw flinty, and the stomates or spiracles are very minute, so that the hyphæ or mycelium of the rust cannot readily find an entrance within the cellular structure of the straw. —GEN. SEC.]

ANNUAL REPORT.—Twelve meetings were held during the past year, the average attendance being ten. Many subjects had been dealt with, and the *Journal of Agriculture* is much appreciated.

OFFICERS.—Retiring officers were thanked, and the Hon. Secretary re-elected. Mr. G. W. Bischof was elected Chairman.

SHEEP.—Mr. H. B. Moody read a paper on "The Value of Sheep on the Farm," to the following effect:—

He had an acquaintance with sheep since he was four years of age, and had seen so many advantages from their presence on the farm that he could not see how he could carry on without them. It would not be profitable to rely alone upon sheep where arable land is situated within the influence of a fair annual rainfall; but would not advocate breaking up saltbush country for agricultural purposes. He thought that occasional cultivation and generous manuring would add greatly to the carrying capacity of any pasturage. His people never had butchers' bills, therefore he could not say what was saved by farmers on that item where they purchased their meat. A good manager would have pigs, poultry, sheep, and young cattle on his farm, and could sell to his neighbors. Wild oats and other weeds will grow, even on the best-managed farms, and the sheep will live upon these and produce mutton and wool. The wool cheque is very useful, and usually comes in when the farmer wants funds to start harvest. Sheep-proof fences are necessary to the successful management of sheep, and the farmer who keeps a breeding flock will do very well if he can pay the costs of fencing and shearing from the sale of sheep and lambs, having the wool as clear annual profit. He had read Mr. Flowers' paper in the May, 1901, *Journal of Agriculture*, but thought it would be only in extreme cases that it would be advantageous to feed sheep on chaff, because the proportion of crops already cut for hay to provide for use on the farm and to supply towns is much too great to allow of large numbers of sheep being fed on hay without effecting a big diminution in the grain crop. Plenty of straw should always be saved to provide feed when the young grass is starting, and when the ewes are lambing. This allows of the animals being kept on a smaller area, so that the grass in other paddocks can get a growth on. A nice warm sheltered place should be selected for the ewes, where they can be protected from dogs, hawks, and crows. By saving straw the ewes are not compelled to search for dry grass that has been bleached by the weather for five or six months, and the lambs may take nourishment whilst the mother feeds at the trough. The chaff from the header and the chaffed header straw is valuable food for sheep. Sheep that are hand-fed during the first part of winter will fatten quickly with the aid of the young grass. Farmers on a large scale should always keep sheep, but those who have small holdings must be careful. In order to make profits it is necessary to be somewhat speculative; for, if the farmer waits until the season is assured, he must expect to pay high prices for store stock. If he buys early, and the rain does not come in time, he has to risk re-selling at a loss, or hold with the liability of starving his stock.

Colton, June 1.

Present.—Messrs. P. P. Kenny (chair), W. L. Brown, E. Whitehead, A. C. Riggs, A. J. Inkster, B. A. McCaffery, W. J. Packer, J. H. McCracken, W. A. Barnes, R. Hull (Hon. Sec.), and one visitor.

SHEEP.—All members agreed that it would not be possible to carry on profitable farming in this locality without sheep. Where there are enough sheep to feed off the weeds for two or three years there is always a good crop of wheat to be raised from that land.

MANURES.—Not many experiments have been conducted with manures, and whilst some have had fair success others have had no results. Mr. P. P. Kenny has used super. for three years, and now wishes to grow some hay, but wishes to know what fertiliser should be used. [Try 50lbs. sulphate of ammonia, or 50lbs. nitrate of soda, per acre.—GEN. SEC.]

GATES ON ROADS.—There is need for some regulation with respect to the nature or form of the obstructions to traffic on public roads. At present, in this district, the "gates" across the roads may consist of a pair of harrows, slip-rails, and even (in a few cases) a neat iron gate. What is required is something that will be wide enough for ordinary traffic, and easily opened and closed.

WEIGHING WHEAT.—Hon. Secretary said some farmers complained that the

weight of bags of wheat in every case was shown to be higher at the farm than upon the scales of the wheatbuyer. He thought the machines ought to be periodically tested by a State official. [Could that farmer's weighing-machine possibly be out of order?—GEN SEC.]

OFFICERS.—Chairman and Hon. Secretary thanked and re-elected.

Gumeracha, June 13.

Present—All the members.

HOMESTEAD MEETING.—This meeting was holden, by invitation, at Mr. W. J. Hannaford's home, at Mount Bera, where a number of visitors were also assembled, and all were hospitably entertained.

CIDER VINEGAR.—Mr. Hannaford utilises all surplus culls and waste apples for manufacture of cider vinegar. The apples are crushed between two pairs of rollers, driven by steam, the pulp placed under a screw press, and the juice fermented.

OTHER ITEMS.—A steam pump supplies abundance of water to all parts of the homestead. The stores for apples are well-contrived and convenient, the stables and piggeries well worthy of inspection, and the flower garden was neat and well kept.

Mount Gambier, June 2.

Present—Messrs M. C. Wilson (chair), T. H. Williams, J. C. Ruwoldt, D. Norman, sen., W. Barrows, A. J. Wedd, E. Lewis (Hon. Sec.).

ABNORMAL HEART.—Mr. Williams showed members the heart of a bull which had suddenly died. When the heart was opened it was found to be filled with hydatids. The bursting of one of the cysts was the cause of the animal's death.

CALCULUS.—Mr. Williams also showed the bladder of a horse which contained an enormous soft sandy calculus, weighing 12lbs. Other calculi were found in the kidneys. The animal had become so poor that it was killed to end its misery.

LICE ON LONG-WOOL SHEEP.—Mr. Williams said lice were becoming prevalent on crossbred and other long-woolled sheep. He had not seen any on the merino. A single dipping would probably not suffice, and the sheep should be kept in the dip not less than one minute. In New Zealand the sheep were not to be dipped until they had two months' wool on them.

Lucindale, June 1.

Present—Messrs E. Feuerherdt (chair), B. A. Feuerherdt, P. J. Robson, A. Dow, S. Tavender, A. Matheson, H. Langberg, A. Carmichael, and E. E. Dutton (Hon. Sec.).

STOCK TRAIN.—The Chairman said the proposal of the Railways Commissioner to run a stock train from Mount Gambier on Monday nights would meet the requirements of stockowners in this district if a special train were run from Lucindale to meet it.

FEEDING SHEEP, &c.—Several members thought that the idea of keeping sheep on farms and manuring land for wheat did not apply to this district. Few, if any, farmers could afford to grow so much hay that they could feed sheep on it. Mr. B. A. Feuerherdt thought it would be better to feed hay to

sheep than to sell it chaffed at 30s. to 40s. per ton. [Members of many branches lose the point of Mr. Flowers' contention, which is, that sheep can be profitably carried over a period of scarcity or absence of natural herbage by feeding small quantities of chaffed hay. He did not advocate constantly feeding sheep with hay, but only as a supplement in times of scarcity.—GEN. SEC.]

PEACH APHIS.—Peach aphis has already appeared on trees in this district. Mr. Matheson does not see any good in remedies which do not altogether exterminate the pests. [If the tobacco and soap solution is properly applied at the roots now, and the branches thoroughly sprayed with it, the pests will be exterminated; but destroying them on a tree will not prevent them coming on from other infested and untreated trees.—GEN. SEC.]

FOXES.—The Chairman read a paper on "The Fox: Is he a Friend or a Foe?" in which he first gave particulars of the nature and habits of that animal. He is cunning, cautious, shy, stealthy, patient, smell and hearing exceedingly keen, and very resourceful, and breeds rapidly in Australia. During twenty years, since first appearance in the South-East, foxes have become numerous everywhere. There is no doubt the fox kills a good many rabbits, and they also eat mice, lizards, frogs, insects, &c., when other food fails. Frogs and lizards are useful in keeping down various insects, and residents can keep the rabbits down without the aid of foxes. The fox also kills poultry, game, small birds, and eats their eggs. Many of those birds are insectivorous, and should be protected. This destruction is now proceeding at an alarming rate, as is evidenced by the remains of such birds found lying about. Then the foxes destroy young lambs, weak sheep, and have been known even to run down strong sheep, and to take out their tongues when the animals are wounded. If the rate of increase goes on, the outlook for sheepfarmers is a serious one, for they must expect a large diminution of the lambing percentage. Up till now the fox has taken poisoned baits fairly well, but its cunning will probably lead him to shun anything in the form of a bait. A trail of the paunch or intestines of a freshly-killed sheep or bullock dragged behind a vehicle will attract the fox, especially if a drop or two of rhodium or anise is put on it. Prepare poisoned baits by rubbing the fingers with some oil of anise or rhodium, then cut small pieces of liver, put a very small quantity of pure strychnine in slits in the bait, close up the aperture, and drop a bait occasionally along the trail. Mr. Tavender would leave the fox alone until lambing time, when he should be kept in check. During the rest of the year the fox helps to keep the rabbits down. [Yes, and increases his family by the dozen, kills all the useful birds he can catch, steals poultry and eggs, and helps to make a scourge that will ultimately be worse than the rabbit and all the other imported pests.—GEN. SEC.] Several members thought the fox would ultimately become a great pest, whilst others believed the trappers would keep it in check. Mr. Dow said so long as skins were paid for the foxes would increase.

Mylor, June 1.

Present—Messrs. E. J. Oinn (chair), W. H. Hughes, Wm. Nicholls, W. J. Narroway, T. J. Mundy, J. Nicholls, J. Roebuck, C. Nielson, F. G. Wilson, W. S. Clough (Hon. Sec.), and five visitors.

OFFICERS—Mr. W. J. Narroway was elected Chairman, W. S. Hughes and C. Nielson, Vice-Chairmen.

ENSILAGE.—Mr. W. J. Narroway read a paper on "Ensilage for our Holdings," to the following effect:—

The locality about Mylor is not naturally a grazing country, but may be made so by a large expenditure on clearing and sowing of grass seeds. To avoid this expense he proposed to

make a pit 12ft. deep, 6ft. wide, and 8ft. long to hold 12 tons, or 48lbs. per cubic foot. Any sort of edible green stuff can be ensiled, and this, when chaffed, is the most easy to feed to cattle. Ensilage loses about one-eighth part of its original weight as green fodder—that is, one ton of green stuff will give about seven-eighths of a ton of silage.—The best time to cut silage is when the plants begin to turn yellow about 1in. up the stalk. Cut it then and chaff it into the pit. It is a good plan to trample the stuff solid, especially round the walls, and, before putting anything else in, place 1ft. of straw at the bottom of the pit. When the temperature in the silage reaches 130° F. pack on more stuff, or put on weights to press it down, and thus prevent the heat rising above 140° F. When the pit is filled, pile boards around the edges so that 2ft. or 3ft. more of green stuff can be packed on, then cover with straw or bags and pile on about 150lb. of earth for each superficial foot. The silage will sink down from one-third to one-half, and can be filled up later on if desired.

Several members said there was a deal of waste in ensilage, and others favored stack ensilage. One member said that a man who kept twenty cows found that fifteen fed with ensilage gave as much milk as twenty without ensilage. [There is practically no waste in ensilage if it is properly dealt with.—GEN. SEC.]

ANNUAL REPORT.—During past year eleven meetings have been holden, with an average attendance of over nine members and three visitors. Fifty exhibits of products have been tabled. There has been a small decrease in number of visitors and of exhibits. Five papers and one lecture have been read. The bull “Prince’s Lad” has progeny of several heifers and a pure bull, and these give promise of being valuable to the district. The Mylor Cow Club has existed 108 weeks; fifteen cows have been bought by the club; four members have drawn, but have not yet selected their cows; there are four yet entitled to draw, and we have £35 in hand. Through this club several people have received cows who otherwise, probably, would not have had them. The Mylor and District Co-operative Society has continued to make steady progress. Cash sales have advanced from £772 7s. 6d. to £792 19s. 11d. for the half year; the gross profits were £81 3s. 6d.; total cost of working, £58 13s. 10d., and net profit, £21 8s. 5d. A bonus of 1s. on members’ purchases, and 6d. on non-members’ purchases, has been paid; leaving a balance of £1 13s. 11d. The membership has increased to fifty-seven, and all this has been brought about by union on “strictly cash” principles.

Yorke town, June 8.

Present—Messrs. J. Koth (chair), A. Jung, C. Domaschenz, A. E. Anderson, T. H. Thomas, and John Davey (Hon. Sec.).

WEEVILS IN BARNs.—Messrs. Koth and Domaschenz each stated that they had got rid of weevils in their concrete-floored barns by spreading salt over the floors. Where the floor is boarded it would be necessary to take up the boards.

Narri dy, June 15.

Present—Messrs. J. Darly (chair), J. Smart, R. Satchell, D. Creedon, Jas. Nicolson, F. Easther, E. Smart, F. B. Flavel, T. Dunsford (Hon. Sec.), and three visitors.

DRILL AND MALTED WHEAT—Some members appear to hold the opinion that drilled wheat this season has been considerably malted, because it was buried uniformly rather than if it had been broad-casted. The Chairman said the drill has come to stay with the farmers; that the present has been an exceptional season; and, even if the drilled seed has become malted, such a thing might not re-occur for ten years. Several theories were advanced by others to account for the malting, but no satisfactory solution was arrived at.

Meadows, June 15.

Present—Messrs. W. Pearson (chair), G. Rice, G. Ellis, T. W. Vickery, T. B. Brooks, F. W. Dohnt, J. Catt, G. T. Griggs, D. Murphy (Hon. Sec.), and three visitors.

PRIVATE SEPARATORS.—Mr. Pearson alluded to the danger to the dairy industry from the introduction of private separators, and, after some discussion, it was decided to ask that the matter shall be considered at the September congress.

SOILS.—Mr. Buttery forwarded a paper upon this subject, based upon its elementary scientific aspects.

OFFICERS.—The officers were thanked and re-appointed.

SHEEP ON FARMS.—The holdings in this locality are too small to allow of keeping sheep, as a rule, especially where pigs and dairy cattle also are kept; but on large farms it would be advantageous to do so.

PIG-BREEDING.—Mr. Rice read a paper at the meeting on May 7, on "Pig Breeding, Feeding, Killing, and Bacon Curing," to the following effect:—

The best stock is a cross between a pure Berkshire sow and an Essex boar, as the progeny will fatten better than the pure Berkshire, and grow larger than the pure Essex, besides producing better bacon. The boar and sow should be at least twelve months old before being mated, as younger sows are likely to have weedy or sickly pigs. The older in season the parents, the larger and the stronger the progeny. Close-breeding results in many defects, such as rupture, deformities, weakness, and bad constitution.

Fattening. For fattening, peas and pollard are as good as can be used; but any kind of corn will do. Feed dry on a good clean floor; this is better than a trough, because the pigs masticate their feed better than when they can take up whole mouthfuls at a time and boot their food. Give pollard and water, not too thick for drink, and give clean water about three times a week, with free access to charcoal.

Killing.—Use a sharp 4in.-bladed knife. Catch the pig, throw it on its back, twist the rope around its nose to keep the mouth shut, hold the rope in the left hand to keep the head steady and straight, and stick the pig in the usual way. For scalding a trough is best, about 4ft. 6in. long, 3ft. wide, and 2ft. 6in. deep, with spars across the bottom to allow the water to flow under the carcass. The temperature of water should be 152° F., or a degree more or less for a finer or coarser-haired pig. This trough needs 15galls. to 20galls. of water. A piece of hoop iron will do to scrape off the hair, and a hook is best to take off the claws.

Cutting up.—When the carcass is cold, saw down the back, take off the head, cut out the hams, remove the foad, cut off the feet, take out the spare rib with a small saw, leaving the three short ribs near the breast or brisket on spare ribs; cut the others off about 1½ins. from the backbone, leaving those on the side. Never take any bone out of the ham, as that will allow the salt to eat up all the lean.

Salting.—Pulverise saltpetre and add ½oz. to each pound of salt—[And 1oz. coarse sugar will improve it. —GRN. SEC.] Mix well, rub in thoroughly with the hand, lay the sides one on the other and leave for three days, then turn skin-sides up after rubbing in more salt; turn again in four days, again in seven days, and in about three weeks the bacon will be fit to smoke. The smoke must be cool and the smoking done in a cool place. Smoke the meat to a light-brown color.

Crystal Brook, May 30.

Present—Messrs. J. C. Symons (chair), W. J. Venning, W. Natt, E. Dabinett, W. Hamlyn, R. Pavy, F. E. Fischer, A. Hamlyn, G. Davidson, M. Weston, P. Pavy, P. H. Claridge, and F. S. Keen (Hon. Sec.).

FIELD TRIALS.—The question of holding a field trial of harvesting machinery was discussed, and it was decided that the Bureau Field Trial Society should arrange for the trial, and advertise the date on the posters and pamphlets issued by the local agricultural societies.

COST OF WHEATGROWING.—Mr. P. Pavy initiated a discussion on this subject, giving an interesting estimate of the cost of cropping 600 acres. Discussion was adjourned till next meeting, when Mr. Pavy will give a paper on the subject.

Orroroo, June 14.

Present—Messrs. W. S. Lillecrapp (chair), G. W. Harding, J. Moody, G. Matthews, J. Jamieson, E. Copley, M. Oppermann, and T. H. P. Tapscott (Hon. Sec.).

PROFESSOR LOWRIE.—A resolution, expressing regret at the prospect of the State losing the services of Prof. Lowrie, was carried: members speaking highly of the good work done by the Professor, and of the great value of his services to the State.

FEEDING WHEAT TO PIGS.—Mr. Matthews asked whether pigs would obtain the most benefit from dry, soaked, crushed, or boiled wheat. The matter was well discussed; most of those taking part being of opinion that crushed wheat was best, as it could be mixed with other food.

Penola, June 15.

Present—Messrs. E. A. Stoney (chair), E. McBain, D. McKay, W. Miller, and R. Fowler (Hon. Sec.).

PROFESSOR LOWRIE.—A resolution regretting the probable loss of Prof. Lowrie, and urging the Government to do all in their power to retain his services, was carried unanimously. Members spoke in high terms of the value of the Professor's services, and of the loss the State would suffer if he left.

Pyap, June 15.

Present—Messrs. C. Billett (chair), W. Axon, B. T. H. Cox, J. Harrington, G. F. Bankhead, J. Napier, E. Robinson, J. Holt, G. Napier, jun., and W. C. Rodgers (Hon. Sec.).

SHEEP ON FARMS.—Members were of opinion that a small flock of sheep paid well where the rainfall is good and the market near. There was, in addition to the direct returns, the saving of the meat bill, the cleaning of the land, &c.

WILD DOGS.—These are again very numerous and destructive, many sheep and calves have been killed during past fortnight. Members were of opinion that the present scalp rate of 3s. should be increased to 5s., in order to induce trappers to return to their useful occupation.

LINSEED.—Mr. Robinson tabled sample of linseed grown under irrigation on his block. The seeds were fine, plump, and oily; the plants averaged a little over 1ft. in height.

Kapunda, June 1.

Present—Messrs. W. Flavel (chair), H. T. Morris, W. M. Shannon, Pat Kerin, E. P. Weckert, J. H. Pascoe, J. J. O'Sullivan, B. R. Banyer, and Geo. Harris (Hon. Sec.).

"A GRAIN OF WHEAT."—Mr. B. R. Banyer gave a lecture upon the above subject, from the standpoint of an analyst, to the following effect:—

The common knowledge respecting a grain of wheat was, like that concerning many things of every day acquaintance, extremely limited. It was mainly confined to the chief purposes of wheat in human and animal life, or nature's economy. Its very common-placeness was largely responsible for the meagre knowledge concerning it. Everybody knew that bread was made from flour which was obtained from the grain, or seed, of the wheat plant. Bread was called the "staff of life," but the phrase to most people conveyed only the idea of its essentiality as a food-stuff for man. That was the superficial and physical aspect of the character

of the grain. There was a chemical aspect, deep and interesting, opening out large and important avenues of thought. Some of these would be suggested in a brief explanation of the characteristics of a grain of wheat—its pent-up forces and potentialities and its chemical and physical properties. With the aid of a diagram, showing the section of a grain of wheat, with the location of cellulose, oil, starch, gluten, and the germ, the structure of the grain was described. The composition of gluten and its association with glutin, and the method of separating one from the other, and also the process for abstracting both from the starch of the flour, were explained. The resemblance, in some respects, of gluten to coagulated egg albumen and the differences in others were pointed out. The different starches and sugars and their chemical composition were mentioned, and how starch may be converted into dextrin—the state in which it is supposed to exist abundantly in the sap of plants—by means of dilute sulphuric acid, was explained. The conversion of the dextrin into sugar and its absorption into the system of the plants, and its subsequent conversion into cellulose—woody fibre—and its re-conversion into starch in the ripened grain, were referred to. This chemical change in the starch was necessary. The starch was insoluble in water, and, therefore, could not enter into the system of the plant. As starch it was not a food, either for plant or human life. For the nourishment of both plant and human life it had to undergo a chemical change, by which it was brought into a condition in which it was soluble, and could thus be absorbed for strengthening of life, but it was then no longer starch. Until the wheat had sufficient strength to derive nourishment from the soil and air, it lived on the starch and gluten in the seed. The little grain was a storehouse of food for the plant until it had grown sufficiently to draw upon exterior provision. Nature had marvellously arranged for that. When the seed began to sprout there was produced at the base of the germ a substance called diastase, which acted upon the starch in the grain and made it available for the plant. As the plant grew the sugar was converted into cellulose, or woody fibre. There was a peculiar analogy between plant and animal life in the process of germination, nourishment, and growth, which was briefly touched upon. The function of the leaves of the wheat plant were referred to, as also was the necessity of plant food in the soil for the production of a healthy plant and a matured and perfect grain. The presence of phosphoric acid, potash, &c., in the grain was also spoken of, as also was their need in the animal and human systems.

Messrs. Morris, Shannon, Pascoe, O'Sullivan, and Flavel each spoke in the highest terms of appreciation of the useful and valuable information given by the essayist. Few people knew *how* seeds grew, nor were they aware of the changes that went on between the time of sowing the seed and harvesting the crop therefrom. The knowledge enabled them to understand why the land required certain treatment for the production of high-class grain in quantity. The lack of scientific knowledge by cultivators of the soil was detrimental to their perfect success. The information given disposed conclusively of any question as to the superiority of plump seed over that which is shrivelled.

Bute, May 28.

Messrs. H. Schroeter (chair), A. Schroeter, E. Ebsary, D. McEvoy, S. Trenchove, W. A. Hamdorf, A. Sharman (Hon. Sec.), and one visitor.

MANURE EXPERIMENTS.—Suggestion from Central Bureau that members should apply to small plots manures in varying quantities, in order to ascertain most profitable amount to use, was considered a good subject for discussion; but it was rather late for this season. [This is a better subject for *experiment*, and the discussion might well come when the results of the experiments are known.—GEN. SEC.]

Finniss, June 3.

Present—Messrs W. W. Heath (chair), A. Green, F. Dreyer, S. Collett (Hon. Sec.), and one visitor.

DRINKING WATER FOR STOCK.—Mr. Chibnall sent a paper, to the following effect:—

Not sufficient consideration appears to be devoted by many farmers to the item of drinking water for the live stock, especially in respect to milking cows; and there is not much doubt that the health of the animals may be affected by the use of unsuitable water. Bad

water will quickly affect the health of human beings, and it naturally suggests itself that the health of the lower animals would also be affected by bad water. Now there are somewhere about 1,000 pigs in the locality, which daily wallow in the bed of the Finnis and its creeks during the summer, and this, with the droppings from the cows, sheep, and other animals on the adjacent watershed, is carried by the rainwaters into the pools. Some people, too, have the nasty habit of throwing the dead bodies of calves, pigs, cats, and all sorts of rubbish over the river bank to save trouble of burial or disposal otherwise, and thus the whole course of the stream is polluted. The stream runs for about six months, and carries all pollution into the pools, which continue to supply drinking water throughout the year. In order to avoid risk to the health of the milch cows, it is advisable to have a well of good water, where possible, on every farm, and to keep a constant supply of water from it in troughs, which should have regular attention in regard to keeping them clean.

Some members did not think that the Finnis water is unwholesome, as it is running over a gravelly bed for most of the time. Mr. Chibnall's farm is situated on the Finnis Swamp, which is often affected by tides, so that a well and troughs on such a farm would be decidedly advantageous.

Port Germein, June 1.

Present—Messrs. G. Stone (chair), W. Crittenden, J. K. Deer, H. Kingcome, E. McHugh, W. Holman, and A. H. Thomas (Hon. Sec.).

NORTHERN CONFERENCE.—This Branch favors holding the 1902 Conference of Northern Branches at Port Pirie.

ABORTION IN COWS.—The Chairman reported that this season two of his cows had slipped their calves six weeks to two months before they were due to calve. He wished to know what was likely to be the cause; the cows had always been quietly treated. Members could not suggest any reason, unless the cows had been injured, such as a kick from a horse. [Is there any ergot in their fodder.—GEN. SEC.]

COMPLETE HARVESTER.—The Chairman invited the members to inspect the complete harvester which he had purchased.

Strathalbyn, June 17.

Present—Messrs. M. Rankine (chair), B. Smith, G. Sissons, R. Watt, G. Meikle, H. H. Butler, D. Gooch, W. M. Rankine, and J. Cheriton (Hon. Sec.).

FRUIT-GROWING.—Paper read by Mr. Meikel at previous meeting was discussed at length; the opinion of the writer, on the whole, meeting with approval.

THE MIDDLEMAN.—The Chairman brought the question of the position of producers and the middleman forward. It was agreed that the present modes of disposing of produce were not satisfactory. Some account sales, showing charges amounting to 12½ per cent. on the total amounts received, were tabled. Members are of opinion that producers should sell through agents, or auctioneers, who sell on commission only, and not through those who buy and sell stock on their own account. Decided action to lessen the evil was imperative.

PROFESSOR LOWRIE.—A resolution that combined action should be taken by the Bureaus and by farmers to retain the services of Professor Lowrie was carried unanimously. Members considered the Professor the right man in the right place, and his removal would be a great loss to the State.

ANNUAL REPORT.—The Hon. Secretary reported eight meetings, with an average attendance of eight members, having been held during the year. Two

papers have been read, and these, with a great variety of subjects of practical interest have been discussed. The Ninth Annual Conference of Southern Branches was held in March, when several very valuable papers were read, but the attendance of members of neighboring Branches was very poor. He thought more interest should be taken by the Branches in these annual gatherings. The Chairman and Hon. Secretary were re-elected for ensuing year.

SUMMER FEEDING AND CATTLE.—Mr. Sissons read a paper on "Cow Feeding in Summer," as follows:—

It has become a very difficult matter, the last two or three years, to know what is the best to feed our dairy cows on to keep them in condition during the summer. Of course the old recommendation is to grow plenty of green fodder; but that is where the problem comes in. For several years I have grown either maize, Jersey tree kale, or mangolds, and I prefer the latter to any of the others. I had a splendid plot last summer, but about the beginning of January of this year the roots began to disappear, and in a short time to my surprise there was not a vestige to be seen; they had been destroyed by the enemies to all farmers, namely, rabbits. I think peas, if properly harvested, will become a great factor towards the object we have in view. Last year I differed from the old method of harvesting peas, letting them stand till the pods were perfectly filled, then had them mown with the grass cutter while in a green state. When in a fit condition carted them home, thrashed them, and stacked the straw. The cows eat this straw splendidly, and will milk a great deal better on it than on wheaten hay, as it is not so dry. There is another great gain which makes it preferable to the old plan, that is, with cutting at this stage you get a great many of the seeds of different weeds, and a great many of the wild oats. There are scarcely any peas left thrashed out on the land at all. The old method that has been followed for so many years was to let peas get thoroughly ripe, then on a damp day take the horsrake and rake up what you could into rows, cart, and thrash. Of course the straw is of no use, only for litter, as all the nourishment has dried out of it. The pigs were then turned in to pick up what was left. All is right as long as the weather keeps fine, but supposing there came a downpour of rain, which causes the peas to swell and grow, they are then of no use for fattening purposes, and the pigs must be sent away no matter what is the state of the market, causing very often a material loss to the farmer. With the other method you have the peas in shelter and can feed your pigs when it suits you, and try to strike the best markets. I think these few facts will speak for themselves as to which is the best of the two methods.

The little rodent, the rabbit, has become a serious menace to all fodder plants, after the grass is dry, notwithstanding the thousands that are poisoned and killed in various ways annually. There is a great deal of difference of opinion about the poison we use. I find phosphorised pollard as good a thing as I have used, though it has its drawbacks, as, after the rabbits are dead and dried, the cattle chew them. Of course the phosphorous is in the stomachs, and this in some instances poisons the cattle. I lost three cows from that cause last year. I think the duty of every individual is to try to the best of their ability to exterminate the pests. If stringent measures are not adopted they will eat us completely out. There should be a simultaneous laying of poison, at the proper season. Since the bush fires there are very few to be seen, but I expect as the spring comes on they will increase, as I am afraid a good many were not burned, only cleared out. I suppose the panacea would be wire netting, but that would be a very expensive cure.

Arden Vale, May 27.

Present—Messrs. E. H. Warren (chair), M. Eckert, C. Pearce, F. Schuttlöf, P. Starr, C. H. Williss, W. J. Willis, C. Miller, and several visitors.

RABBIT DESTRUCTION.—Members thought the local district council should follow the example of the Orroroo Council and obtain a few Crockford torpedo rabbit-exterminators, for hire to the ratepayers.

PRICE OF IMPORTED MACHINERY.—The Chairman drew attention to discussion at April meeting of Millicent Branch in reference to the high prices charged for imported machinery. This matter had also been referred to publicly by Hon. Kingston and Holder, and, as far as he knew, the statement had never been disproved. It seemed to him that the only remedy was for the farmers to

become their own importers, by joining the Farmer's Union. The union imported and sold binders to their members at quite 30 per cent. less than was charged for other binders. Mr. Pearce said the American manufacturers could, in consequence of the magnitude of their operations, turn out this machinery at very low rates; but, notwithstanding the fact that they were admitted free to this State, the Importers' Association fixed exorbitant prices. In Canada the farmers were in a similar position a few years ago. Members were of opinion that this was a matter which the Farmers' Union, as it grows stronger, should devote greater attention to.

PICKLING SEED WHEAT.—Mr. Eckert directed attention to report of Maitland Branch on this subject. Three of his acquaintances had tried lime pickling, but the portions of the crop so treated were badly bunted. Most members had not tried lime as a pickle. Mr. Williss said his father allowed the seed to stand in salt and water over-night; then, next morning, it was dressed with lime. His brother also pickled with lime, with satisfactory results; but it was a nasty job sowing lime-pickled seed. Members were of opinion that to wash "smutty" seed was always beneficial, and thought the reason self-sown crops were so free was that the rains washed the spores off the grain. Variation in methods of pickling with lime would probably account for the different results obtained. [The spores of bunt on self-sown wheat, &c., are started into growth by slight moisture which is not sufficient to start the seed of the cereal. The consequence is that the bunt plant dies for want of a host plant, upon which it could have lived as a parasite. — GEN. SEC.]

Burra, June 14.

Present—Messrs. F. H. Field (chair), J. Flower, F. G. Dawson, and R. M. Harvey (Hon. Sec.).

CABBAGE APHIDS.—Mr. Dawson was recommended to use tobacco or quassia chips in water for this pest. The season's prospects and the recent welcome rains came in for consideration.

Brinkworth, May 31.

Messrs. J. F. Everett (chair), W. H. Pearce, Jas. Graham, A. W. Morrison, G. Wooldridge, J. Cross, W. Welke, C. Ottens, A. L. McEwin, J. Stott (Hon. Sec.), and one visitor.

ANNUAL REPORT.—The Hon. Secretary's annual report showed that during the year eleven meetings were held, two being at members' homesteads. Seeds of various kinds had been received from Central Bureau, some of the wheat giving promise of great value to the district. The Jersey Bull loaned by the Department to the Branch had been stationed in different parts of the district for a few months at a time. Members should endeavor to bring visitors to the meetings, the general public apparently being under the impression that the meetings were only for members. Messrs. A. L. McEwin and Jas. Graham were elected Chairman and Vice-chairman, respectively, and Mr. J. Stott re-elected Hon. Secretary, for ensuing year.

FARM LIFE.—Mr. Everett read a paper on "Why is Rural or Farm Life so distasteful to so many Young People":—

I daresay most of us have noticed a dissatisfied and unsettled feeling among a great number of the young country people with whom we come into contact. Now, why is this so? Country life and occupation should be quite as interesting and enjoyable as life in the city. Let us look at some of the disadvantages that the young people in the country, and on farms in particular, labor under, compared with others in the towns. They have to be up in the mornings by five o'clock—some of them sooner—and out in the fields as soon as it is light, working the

drills and other implements This is not a very tempting job on a cold frosty morning. In the harvest, working about fourteen hours every day. Not only are the hours long, but the work is very often laborious. Again, you see farmers' sons working from one year's end to the other with scarcely a break or holiday of any sort. Perhaps in the spring of the year they may attend one or two of the local shows, and are then presented with four or five shillings and a caution not to spend it all. What with dry seasons, low prices of produce, &c., most parents at the end of the year are not in the position to do much for their children in the form of remuneration. What with working year in and year out, with only mutton and bread three times a day six days a week, wearing moleskin trousers, hobnail boots, and billycock hat all the week, and a slop-made suit of shoddy for Sabbath, there is not much attraction for a great many of our young folks, and it is no wonder they get dissatisfied with their surroundings. About twenty young fellows have left the immediate neighborhood within this last year or so. Can we blame them, looking at the apparent advantages that are seen to prevail in large centres of population, where they would have to work only forty-eight hours per week, or eight hours per day, have half a day holiday every week, besides all public holidays. When they leave work in the afternoon they have all the evening to themselves, whereas the farmers' men have their horses to attend to up till bed time.

Considerable discussion ensued, the bicycle coming in for a share of the blame. [Where does the poor "bike" come in? Does it make farm life less attractive, or does it add to the attractions of the town?—It can scarcely be the pleasures attached to cycling, as the farmers' sons who leave the farm because of the hard work will not appreciate the muscular exercises involved in cycling. I am sure the majority of readers will agree that farm life is hardly so black as painted by Mr. Everett—GEN. SEC.] Members agreed to a large extent with the paper, but the disadvantages of town life, and the opportunities for recreation within reach of the farmers' children, were touched on by several.

NORTHERN CONFERENCE.—Members of this Branch favor holding the annual Conference of Northern Branches at Gladstone, as heretofore.

Mount Pleasant, June 14.

Present—Messrs. G. Phillis (chair), W. Lyddon, W. Royal, R. Godfree, P. Miller, jun., J. F. Miller, and H. A. Giles (Hon. Sec.).

MEMBERSHIP.—The death of Mr. W. M. Vigar, a late member of the Branch, was referred to in feeling terms, and a letter of condolence sent to the family.

OFFICERS.—Messrs. Geo. Phillis and H. A. Giles were re-elected Chairman and Hon. Secretary, respectively. During the year nine meetings have been held, the average attendance being only fair. Two papers were read and discussed, and a visit of inspection paid to the Roseworthy Agricultural College.

BUSH FIRES.—A committee was appointed to examine roads proposed to be fed down closely in winter to prevent spread of bush fires, and to prepare plan to lay before the district council for consideration.

Gawler River, May 31.

Present—Messrs. J. Badman (chair), H. Roediger, D. Humphreys, J. Barrett, J. Hillier, E. Winckel, R. Badcock, and A. Bray (Hon. Sec.).

PARASITE OF DRIED FRUIT MOTH.—The Hon. Secretary reported having found, what he believed to be, a parasite of the caterpillar that attacks dried fruit. The specimens were sent by the General Secretary to Chas. French, Esq., F.L.S., Victorian Entomologist, and to W. W. Froggatt, Esq., of Sydney, both of whom identified it as a parasite which might prove a useful agent in preventing or lessening damage by the dried fruit moth.

SHEEP ON FARMS.—This subject was discussed in connection with paper by Mr. J. F. Flower, of Onetree Hill Branch. Mr. Badman had been feeding sheep on hay and chaff, but found it very wasteful to use hay. Members thought

thought that 1lb. to 1½lb. chaff per sheep per day, while enough to keep them in condition, would not fatten them. Mr. Badman found the merinos very shy of feeding troughs, more so than the crossbreds. Members generally agreed that it was profitable to keep sheep, even if only a few for home use, and that the merino was the best for the farmer, producing the best of wool and the sweetest of mutton, besides being quiet and docile. Mr. Badcock found it a good plan to keep a few sheep from the old flock to educate and quieten new purchases.

QUANTITY OF MANURE PER ACRE.—Members generally were of opinion that, taking the good seasons with the bad, it was too risky for farmers to use 2cwts. of super per acre. On light soil the practice might answer, but members feared that in dry seasons the crops on heavy lands would suffer from blighting. The question should, however, be tested by means of series of experiments, extending over a period of several years. Members ridiculed the idea that any arsenic that might be contained in super. would injure the feeding qualities of hay or grain.

Bowhill, June 1.

Present—Messrs. J. Gregory (chair), E. P. Weyland, W. Towill, F. H. Baker, G. A. Prosser, N. P. Norman, C. Drogemuller, J. Waters, J. G. Whitfield, F. A. Groth (Hon. Sec.), and J. Schenscher, of Forster Branch.

IMPACTION.—Mr. Towill gave an address on the disease prevailing amongst cattle in this district, viz., dry bible, or impaction of the omasum, and promised to read a paper on the subject at next meeting.

OFFICERS.—Messrs. J. T. Gregory, N. P. Norman, and F. A. Groth were re-elected Chairman, Vice-Chairman, and Hon. Secretary, respectively, and thanked for past services.

Davenport, June 12.

Present—Messrs. W. T. Trembath (chair), J. E. Lecky, T. McDowell, A. McDonald, F. B. Rathbone, and J. Roberts (Hon. Sec.).

POULTRY ASSOCIATION. A sub-committee appointed at previous meeting, for the purpose of endeavoring to establish a Poultry Society for the district, now reported having succeeded in their object.

Minlaton, June 15.

Present—Messrs. J. Brown (chair), J. Martin, H. Boundy, S. Vanstone, D. G. Teichelmann, H. Martin, and J. D. Mayer (Hon. Sec.).

FERTILISERS.—With respect to the kinds of fertilisers and the quantities to be used for various crops, members consider that there are so many variations in the soils of the different farms, and so many diverse conditions affecting them, that it is necessary that each farmer should conduct experiments to satisfy himself with regard to this question.

Lyrup, June 11.

Present—Messrs. P. Brown (chair), T. B. Brown, A. Weaver, A. Pomeroy, A. Menzies, D. J. Tree, O. Klem, D. Thayne, W. Healey, G. A. Bollenhagen, and T. Nolan (Hon. Sec.).

EXHIBITS.—Mr. Menzies tabled three cobs of sweet maize, several large piemelons, and some mangolds. Mr. Pomeroy tabled a large bunch of bananas, also some Kaki or Japanese date plums, and cobs of Horse-tooth maize.

Cherry Gardens, June 11.

Present—Messrs. R. Gibbins (chair), C. Lewis, T. Jacobs, A. Broadbent, W. B. Burpee, H. Strange, C. Ricks (Hon. Sec.), and one visitor

PROFESSOR LOWRIE.—A resolution, urging that every effort should be made to retain the services of Professor Lowrie, was carried.

HORSE-BREEDING.—Mr. Burpee read a paper on this subject, which was well discussed.

EXHIBITS.—Mr. Strange tabled cauliflower weighing 16lbs.

Port Elliot, June 22.

Present—Messrs. J. McLeod (chair), W. E. Hargreaves, H. Pannell, C. Goaden, H. Gray, R. E. Ullrich, O. B. Hutchinson, H. Welch, and E. Hill (Hon. Sec.).

MANURING OF CEREALS.—Some discussion took place on question of most profitable amount of manure per acre to apply to cereal crops. It was generally agreed that, while differences of soil and climate, and also the different varieties of wheat grown, must affect the question, for the bulk of the land in this district 2cwts per acre would not be too much.

PROFESSOR LOWRIE.—This Branch desires to record its deep regret that Professor Lowrie has decided to sever his connection with this State.

Port Lincoln, May 19.

Present—Messrs. W. Laidlaw (chair), J. D. Bruce, E. Chapman, W. E. Goode, R. Puckridge, J. C. Richardson, and J. Anderson (Hon. Sec.).

RABBIT DESTRUCTION.—Mr. Goode read an article from the *Australasian* on this subject, recommending the destruction of rabbits in burrows by turning into the burrow a live rabbit with a skin, which had been saturated in a solution of phosphorus and bisulphide of carbon, tied to the hind leg. Members were of opinion that this method was attended with too many risks to admit its general adoption.

PICKLING WHEAT.—Mr. Puckridge advised pickling the seed well ahead of requirements, say seven days before sowing. He used 1lb. bluestone to 15galls. water, and found this thoroughly effective in preventing bunt. Mr. Anderson thought if the farmer could arrange to pickle the seed seven days ahead the bluestone might be dispensed with, as, if the wheat were thoroughly damped and allowed to dry, and not be planted for a week, the bunt spores would probably have germinated and died for want of a host to live upon.

Mount Compass, June 15.

Present—Messrs. M. Jacobs (chair), R. Peters, W. Gowling, F. Slater, D. J. Hutton, A. Sweetman, R. Cameron, S. H. Herring, J. Jenken, C. S. Hancock, and F. McKinlay.

GARDEN OPERATIONS.—During month prepare ground for onions, and plant carrot, parsnip, and tomato seeds—the latter in boxes.

PIGS.—Mr. Jenken initiated a discussion on pig-keeping. In reply to inquiry he was advised to give tobacco or sulphur to pigs attacked by worms.

OFFICERS.—Messrs. M. Jacobs, R. Peters, and M. J. Hancock were re-elected Chairman, vice-Chairman, and Hon. Secretary, respectively, for ensuing year.

Millicent, May 9.

Present—Messrs. H. Holzgreffe (chair), J. J. Stuckey, R. Campbell, B. Varcoe, H. Warland, B. Varcoe, and E. J. Harris (Hon. Sec.).

HOMESTEAD MEETING.—This meeting was held at the home of Mr. J. J. Stuckey, where afternoon tea was provided by the host.

MANURIAL EXPERIMENTS.—Mr. J. J. Stuckey reported that Mr. W. B. Altswager had used 1cwt. of super. per acre on one plot of wheat and 1½cwts. on another, leaving a portion of each unmanured. The unmanured land yielded 5bush. of wheat per acre; the crop from land receiving 1cwt. manure was 20bush., and from that on which 1½cwts. was applied even a larger crop was realised. Mr. Warland reported that Mr. R. Agnew used 2cwts. on about three-quarters of an acre of land, and sowed with malting barley, which was estimated to have yielded 60bush. per acre; where only ½cwt. was used the crop was very poor. The Chairman said he found the grass was much better after manured crops, and the stock preferred it to other grasses.

HOLSTEIN BULL.—The chairman reported very favorably with respect to the Holstein bull, Friesland, which had now left the district. He could not speak appreciatively of another Holstein which had taken his place.

PASPALUM DILATATUM.—The Hon. Secretary said he had sown seed of this grass in April, but it had not germinated well. Mr. R. Campbell said the seed should not be sown until August. He had some growing in his orchard which was of a vivid green during the height of summer.

HAY FOR SHEEP.—Mr. B. Varcoe will sow oats to cut as hay for feeding sheep and other stock, as is done in New Zealand. The Chairman promised to read a paper on this subject at the next meeting.

[The above report got astray; hence delay in publication.—GEN. SEC.]

Millicent, June 13.

Present—Messrs. H. F. Holzgreffe (chair), H. Hart, B. Varcoe, H. Oberlander, H. Warland, R. Campbell, H. A. Stewart, W. R. Foster, W. J. Whennen, Geo. Mutton, and E. J. Harris (Hon. Sec.).

MARRAM GRASS.—Mayurra District Council replied that the Marram grass planted some time since on Canunda had failed absolutely through having been planted on the wrong side, and got buried in drift sand before it had a chance to start.

PRUNING DEMONSTRATION, &c.—Mr. R. Campbell said that Mr. Geo. Quinn had delivered lectures at Kalangadoo on June 4th, at Millicent on June 5th, and at Tantanoola on June 6th. He had given pruning demonstrations at Bordertown on June 4th, at Millicent on June 6th, and at Tantanoola on June 8th. Both the lectures and the demonstrations were well attended. [Mr. R. Campbell's modesty did not permit him to state that he conveyed the

Horticultural Instructor for three days and during the best half of two nights all over the district in his trap.—GEN. SEC.]

RAINFALL FOR MAY.—Millicent, 2.73in.; Mount McIntyre, 3.26in. These are the highest records for the month in this State.

EXPORT OF APPLES TO WESTRALIA.—Mr. Campbell directed attention to fact that the West Australian Government proposed to admit pip fruits, provided they are grown in clean districts. The codlin moth existed near Millicent, and it was a pity that owners of affected orchards had not at once made the fact known. Mr. Hart thought some steps should be taken to compensate owners in hitherto clean districts who would undertake to destroy all fruit for one or two seasons. Members unanimously resolved to oppose by memorial any effort to relax the codlin moth regulations under the Vine, Fruit, and Vegetable Protection Act.

FOXES.—Mr. H. A. Stewart said this is the best time of year to poison foxes with dead birds and strychnine. One landowner at Woakwine had recently poisoned thirty foxes.

DAIRY COWS AND CALVES.—The Chairman read a paper on "Keeping and Feeding Dairy Cows and Rearing Calves," to the following effect:—

Dairying is not always a paying industry where hired labor has to be kept, but where there is a family to do the work, it well managed, it will be a good help to the farmer's income. The first thing is to get a herd of good cows, but these cannot always be bought in the market, and it takes a long time to breed them. In buying cows it will pay well to give a little more money for good ones, as cheap inferior cows are much dearer in the long run. Shorthorns and Holsteins are to be preferred. They are good milkers, generally very quiet; and, being fair-sized, are capable of being fattened for the butchers. It is a great mistake to keep dairy cows till they get old and die in winter. When they are eight or nine years old it is advisable to spey them when they are in full milk, and they will often last in milk for a long time. They soon get over the operation, and fatten easily afterwards. The butcher will give more for speyed cows. It makes a big difference to receive £6 to £4 for a worn-out milker instead of having merely to flay her and sell the skin for 10s. or 12s. The next most important thing is to keep the cows in good condition, else they will be worth very little. The best grass paddocks in the district are good enough for about six months each year—from August until January, but after that the cows fall away unless they are partly hand fed. It is a great mistake to let them get poor. Various crops should be grown, such as maize, sorghum, beets, mangolds, &c. If these cannot be grown, good wheaten hay, cut on the green side, chaffed and damped a little, makes a splendid feed. It may not improve the flow of milk, but will certainly give more cream, and keep the cows in better condition. Ten cows well kept are better than twenty half starved. Good pure water is essential, and where it is not slightly brackish the cows should have some salt near the milking yard. Rearing of calves is of importance. Take them at once away from the cows, and feed them on sweet milk for the first five or six weeks, regularly twice a day. After that skim milk, warmed up to about 90° F., may be used, but each calf must have its proper proportion—not a quantity poured into a trough for ten or twelve calves, as is often done, whereby some get too much and others not enough. Some good chaff, as for the cows, mixed with a little bran, should be given them to keep them from scouring. Half-starving any animals is poor economy, as many are lost; none are as effective as when well kept, and if sold they fetch poor prices.

Mr. Campbell thought it would be a good calf that would fetch the value of the new milk it would consume in six weeks. That, reckoned at 3d. or 4d. per gallon, would amount to 21s. or 27s. Mr. Davidson said a calf would consume about 12s. worth of milk during the period of hand-rearing. It was a good plan to select heifers from the best cows. The Dairy College of Wisconsin recommends steaming or moistening of chaff given to dairy cows. Salt is most valuable for horses, cows, or sheep, especially in a district where all the water is quite fresh. Mr. Hart had a neighbor who found it profitable to damp the chaff some hours before feeding it to his cows; and the Chairman said his calves always did well on the treatment recommended. It was stated that the proprietors of Coola station recently had 150 cattle speyed, at a cost of about 1s. per head, with only one loss. Mr. Foster had had much experience in the butchering trade in England, and said speyed cows killed much better than those that were not thus treated.

Balaklava, June 8.

Present—Messrs. P. Anderson (chair), C. L. Reuter, G. Reid, A. Manley, W. H. Thompson, W. Smith, A. W. Robinson, A. Hillebrand, J. Crawford, E. Hains, W. H. Sires, W. Tiller, G. Neville, and E. M. Sage (Hon. Sec.).

OFFICERS.—The Chairman and Hon. Secretary were thanked and re-elected.

MEMBERSHIP. — Members are desirous to know if it is allowable or desirable to have any members of Branches under 21 years of age. [It all depends upon the amount of practical knowledge and common sense of the proposed member. Some boys of 15 may know a great deal more of scientific and practical agriculture than will be known in some instances by men of mature age. As a rule (with exceptions as above), it is *not* desirable to have boys or very young men nominated as members of Branches of the Agricultural Bureau.—GEN. SEC.]

MODIOLA DECUMBENS.—The Hon. Secretary said he had raised plants of this last season from seeds received from the Central Bureau. They had grown all through the winter, withstood all the night frosts well, and most of them had lived through the summer without any watering. Plants had reached a diameter of 2ft., but they were practically useless in sandy country, because they crept so closely to the soil that they were always covered with sand, which would be taken up by stock feeding upon them. Many seedlings were springing up around the old plants, which are still growing.

SHEEP ON FARMS.—Members are unanimous in their opinion that the value of sheep on any farm of moderate size cannot be questioned.

FEEDING SHEEP DURING DRY SEASONS. — Mr. Manley thought it will pay to feed sheep on wheat at present prices, especially if it is mixed with cocky chaff. Other members consider there would be danger in feeding wheat to sheep unless it were first soaked or crushed, as there were sure to be some "bosses" amongst the flock, who would get more than their share. The Hon. Secretary thought it would pay to put down ensilage, especially for lambing ewes. Ensilage, if well made, would keep good for several years. In a good season self-sown crops could be cut early for ensilage, and then there would be an aftermath that would be good feed, with less for the sheep to tread down and waste. Other members thought it would be better to make hay of the self-sown crops, as the sheep would take to it more readily. [When the sheep have learned to eat ensilage they will leave dry hay all the time.—GEN. SEC.] Mr. Reuter said he had difficulty at first to get his cows to eat ensilage, but after they got used to it they would chase him for it. Mr. Reid doubted if, on a farm where sheep are kept, there would ever be self-sown crops good enough to make either hay or silage.

Willunga, June 15.

Present—Messrs. W. J. Blacker, M.P. (chair), Thomas Atkinson, John Binney, W. J. Binney, J. Valentine, Thos. Pengilly, J. McMurtrie, J. A. Hughes, A. Slade, John Allen, W. J. Kimber, and C. Bray (Hon. Sec.).

PICKLING WHEAT.—Mr. T. Atkinson said he had used limewater with a little salt added for some years with great success. His crops had been practically free from bunt. Members consider lime to be most unsuitable when a phosphatic fertiliser is used with the seed, and the general opinion was in favor of bluestone. It was thought that the bunted crops in the district were caused by the farmers neglecting to pickle their seed wheat. Many farmers in this locality seem to think that it is not necessary to pickle seed for a hay crop, but members said their experience proves that it is very necessary to pickle seed, either for grain or for hay.

MANURING AND FALLOWING.—Mr. T. Pengilly said that, by fallowing his land and using 1cwt. English super. per acre, his returns were considerably increased, and he strongly advised farmers to adopt the same practice, when he was sure similar results would follow. Mr. John Binney also had got twenty-five and thirty bushels per acre from land similarly treated. The quality of the wheat was good, although the land had been under cultivation for about forty-five years.

EXHIBIT.—Mr. Thos. Pengilly tabled a Long Red Mangold, 24lbs. weight, grown without manure.

Clare, June 14.

Present—Messrs. W. Kelly (chair), Treleven, G. Lloyd, R. E. Hope, J. T. Hague, R. S. F. Martin, J. H. Yelland (Hon. Sec.), and one visitor.

CODLIN MOTH.—Suggestions were invited on the best means to adopt to eradicate the codlin moth in this district. Those made by Mr. J. Miller, M.P., were considered, but in the opinion of members could not be satisfactorily carried out. [What were these suggestions? Possibly other Branches would be interested in them.—GEN. SEC.] It was thought that if the fruitgrowers had the interests of the district at heart they would move in the matter, and take action to prevent the introduction and spread of the pest. Members should interest themselves, and report any new source of infection. Members were of opinion that the Branch should have a say in the appointment of the local fruit inspector, the following resolution being carried:—"That the election of the inspector of fruit be referred to the Branch, and a copy of his reports be laid periodically before the Branch." [The appointment of paid officers rests with the Hon. Minister of Agriculture and is not a question of "election" by Branches.—GEN. SEC.]

PROFESSOR LOWRIE.—A resolution, expressing confidence in Professor Lowrie and urging the Government to do all in their power to retain his services, was carried.

OFFICERS.—Messrs. W. Kelly and H. J. Yelland were re-elected Chairman and Hon. Secretary, respectively, for ensuing year.

Angaston, June 15.

Present—Messrs. F. Thorne (chair), R. Player, W. Sibley, J. Vaughan, J. Heggie, A. Friend, J. H. Snell, J. E. Swann, R. Radford, A. Salter, J. Treacowthick, and E. S. Matthews (Hon. Sec.).

CODLIN MOTH.—It was resolved that, in the opinion of this Branch, the regulations prohibiting the sale of infested fruit should be strictly enforced.

PROFESSOR LOWRIE.—A resolution, expressing appreciation of the valuable services rendered by Professor Lowrie and asking the Government to endeavor to retain his services, was carried.

ALMONDS.—Mr. Snell called members' attention to the article in one of the daily papers advocating the planting of almonds, and pointing out the profitability of the industry. [The principal reason why almonds are not grown more largely is that they are very uncertain croppers; possibly owing to the fact that they bloom very early, and a wet windy August means little fruit. In a poor season almonds fetch high prices, but in good years it has not been an infrequent occurrence for the crop to be left to fall on the ground, owing to low prices. With proper attention there is little doubt that almonds will pay fairly well, but the prospects are not quite so alluring as have been painted.—GEN. SEC.]

Stansbury, June 8.

Present—Messrs. A. Anderson (chair), P. Anderson, J. Sherriff, J. Antonio, C. Faulkner, and P. Cornish (Hon. Sec.).

PROFESSOR LOWRIE.—Resolution was carried, expressing regret at probable departure of Professor Lowrie and urging retention of his services for South Australia.

SEED DRILLS.—Mr. Faulkner reported that the disc drill he had purchased appeared well adapted for drilling in mallee land. It worked in a manner that thoroughly satisfied him.

Mount Bryan East, June 1.

Present—Messrs. T. Wilks (chair), J. Wilks, W. Quinn, W. Dare, A. Pohlner, J. Honan (Hon. Sec.), and two visitors.

FEED FOR SHEEP AND CATTLE.—It was decided to ask the General Secretary for information as to the most economic fodder for sheep or cows. [It is impossible to answer such a bold question as this. There is nothing to show whether the members mean what is best to add to the indigenous, or usually cultivated fodders, or whether they want to know which is the best of these latter. In any case the experiences of the feeders of stock is of more importance than the opinion of the General Secretary.—GEN. SEC.]

IRRIGATION.—Mr. Quinn tabled a splendid sample of pumpkin grown on land that received one flooding during the season. Members considered this good evidence of what could be grown even in a very dry season, under irrigation. [And in many dry districts, where no green stuff is grown for stock, a little expenditure, principally in labor, would enable small areas of ground to be flooded occasionally.—GEN. SEC.]

Naracoorte, June 2.

Present—Messrs. S. Schinckel (chair), H. Hassler, J. G. Forster, F. Welcome, W. Buck, A. Caldwell, E. R. Peake, E. Thomas, and A. Johnstone (Hon. Sec.).

SHEEP ON FARMS.—Nearly every farmer in this district finds it profitable and necessary to keep some sheep, as there are patches of land that are suitable only for sheep. In the northern parts of the State it would generally be wise to keep some.

OFFICERS.—The Chairman and the Hon. Secretary were thanked and re-elected.

HERB-GROWING.—Mr. E. R. Peake referred to the large quantities of culinary and other herbs that are annually imported into these States from foreign countries. For instance, about 60 tons of marjoram, valued at £75 per ton, were sent annually to Australia. Other members mentioned thyme and sage as being imported and used in very large quantities, and it was considered that women and children could make a nice little income from growing and drying these herbs for sale to butchers and others.

TELLING THE AGE OF HORSES.—Mr. J. G. Forster read a paper on this subject, discussion on which was deferred.

EXHIBIT.—The Chairman laid on the table samples of Professor Maercker and Ehler potatoes received from Mr. Krichauff, Chairman of Central Bureau. They were sound, handsome, and large. He planted the setts on January 11, and had to water the plants.

INDUSTRY.

SUPPLIED BY THE DEPARTMENT OF INDUSTRY.

Labor Bureau.

Number of Persons Registered and Found Employment by Government Departments and Private Employers from May 31 to June 27, 1901.

Trade or Calling.	Number Registered.		Number Employed.
	Town.	Country.	
Laborers and youths	103	150	199
Masons and bricklayers	5	—	2
Carpenters and improvers	8	1	3
Plasterers	—	—	3
Painters	8	2	25
Boilermakers and riveters	2	1	—
Blacksmiths and strikers	1	—	—
Iron and brassmoulders	2	1	—
Fitters and turners	2	2	—
Enginedriver and fireman	1	—	—
Plumbers	—	—	3
Tinsmiths	1	—	—
Ironmongers	1	—	—
Coach trimmer	1	—	—
French polisher	1	—	—
Compositors	1	—	4
Baker and cook	3	1	1
Gardeners	—	—	2
Watchmen	—	—	1
Messengers	—	—	1
Apprentices	8	1	—
Cleaners	11	12	—
Porters and junior porters	24	14	3
Rivet boys	5	—	—
Totals	188	185	247

June 27, 1901.

A. RICHARDSON, Bureau Clerk.

The Factories Acts.

CONTRIBUTED BY CHIEF INSPECTOR BANNIGAN.

(Continued from Page 940.)

In every factory there shall be constructed a sufficient number of water-closets for separate use of each sex, which shall be kept in good order; and any person who shall employ women or young persons in any factory without complying with the provisions of this section shall be deemed to have committed a breach of the Act.

In every factory the occupier shall provide such means of extinguishing fire as the inspector may direct, and shall provide a sufficient number of lavatories for the separate use of each sex.

The Minister may, by notice in writing, forbid the occupier of a factory where noxious trades are carried on to permit any employes therein to take their meals in any room while work is being carried on therein; and may, by notice in writing, direct an occupier to erect or provide a suitable room or place in the factory, or in connection therewith, for the purpose of a dining or eating room for employes in such factory. If the occupier fail to comply with such notice within a reasonable time, the factory shall be deemed not to be kept in conformity with the Act.

The Minister may, by notice in writing, forbid the occupier of a factory to use any premises as a factory which, in the opinion of the Chief Inspector, are unsuitable for the purpose by reason of deficiency of light or ventilation, or by reason of structural defects or proximity to insanitary conditions. If the occupier fail to comply with such notice within a reasonable time, the factory shall be deemed not to be kept in conformity with the Act.

The traversing carriage of any self-acting machine in any factory shall not be allowed to run out within a distance of 18in. from any fixed structure, not being part of the machine, if the space over which it so runs out is a space over which any person is likely to pass, whether in the course of his employment or otherwise.

The occupier of a factory shall securely fence or safeguard all dangerous parts of the machinery therein; and, with respect to such fencing or safeguarding, the following provisions shall have effect:—

- i. Every hoist or teagle, and every flywheel directly connected with steam, gas, oil, electric, water, or other mechanical power, whether in the engine-house or not, and every part of a steam-engine and waterwheel, shall be securely fenced; and
- ii. Every wheel-race not otherwise secured shall be securely fenced close to the edge of the wheel-race; and
- iii. Every part of the mill gearing shall be securely fenced, or be in such position or of such construction as to be equally safe to every person employed in the factory or workroom as it would be if it were securely fenced; and
- iv. All fencing and safeguards shall be constantly maintained in an efficient state while the parts required to be fenced or guarded are in motion or use for the purpose of any manufacturing process; or
- v. For the purpose of this section, and of any provisions of the Act relating thereto, "machinery" shall be deemed to include any driving strap, band, wire rope, or cable of any kind.

A factory in which there is a contravention of this section shall be deemed not to be kept in conformity with the Act.

Every inspector under this part of the Act shall be a qualified mechanic.

If an inspector considers that in a factory any part of the machinery of any kind moved by steam, oil, gas, electric, water, or other mechanical power, to which the provisions of the Act with respect to the fencing of machinery do not apply is not securely fenced, and is so dangerous as to be likely to cause bodily injury to any person employed in the factory—

1. The inspector shall serve on the occupier of the factory a written notice to fence the machinery which he considers dangerous as aforesaid:
- ii. If the occupier of a factory fails to comply within a reasonable time with the notice, or fails to keep the said machinery securely fenced in accordance therewith, or fails to constantly maintain such fencing in an efficient state while the machinery required to be fenced is in motion, the factory shall be deemed not to be kept in conformity with the Act.

Working Girls' Club.

BY MRS. INSPECTOR MILNE.

For the purpose of providing a place where working girls may meet weekly for recreation and mutual benefit, a Working Girls' Club has been established at the Rechabite Hall, Grote Street, Adelaide. Tea is provided free by the committee on Monday evenings from 6 p.m. to 7 p.m., and from 7 p.m. to 9-30 p.m. the rooms are available for the recreation and enjoyment of the members. For many years our aim and object has been to benefit the general body of female workers, independently of religious instruction or trades unionism, and we are hopeful that by the inauguration of such a society our aims will be realised, and a missing link found to weld together the great practical needs of our common humanity.

The committee specially aim at inducing those girls who have no social attractions in the home during the evenings to avail themselves of such a place, where they can spend a quiet and enjoyable time, instead of parading the streets, as so many are induced to do through having no better place to go to.

Subjoined I append code of rules for the management of "The Working Girls' Club," the inauguration of which took place on Monday, May 6th, 1901.

Name.

The name of the club shall be "The Australasian Working Girls' Club."

Object.

The object of the club shall be to provide recreation and instruction to all working girls.

Maintenance.

The committee shall have power to appeal for and accept voluntary contributions, and to raise funds in any other way they may think fit. The funds so raised shall, in addition to members' subscription, which shall be entrance fee threepence, and one penny per week subscription, be used in support of the club.

Membership.

Membership shall be open to all working girls, and they shall be entitled to all the privileges and advantages of membership.

Workers.

A council of workers shall be formed, which shall consist of those selected by the committee, to act in turn for the purpose of taking part in the instruction and entertainment of the members of the club.

Government.

The club shall be governed by a general hon. committee, which shall consist of an hon. president, secretary, and treasurer, with ten hon. members, with power to add to their number.

Management.

The general committee shall have the entire management of the club. It shall elect from among its number a secretary, and shall have power of conferring and determining membership and of delegating its power to any sub-committee or to any hon. officer.

Sub-Committees.

The general committee shall have power to elect any sub-committees it thinks fit, from within or without the club.

Hon. officers shall be *ex officio* members of this council and of all sub-committees.

General Committee.

The general committee shall meet not less than four times a year, and not less than five shall form a quorum.

General Meetings.

A general meeting of members shall be held once a year, in April, to elect the general committee, and for such other business as may arise of interest to the club. Other general meetings may be summoned by the general committee whenever it thinks fit.

Annual Report.

An annual report and balance-sheet shall be furnished to subscribers annually by the general committee.

Auditors.

Two honorary auditors shall be elected annually by the general committee.

Any alterations in these laws shall be carried by not less than three-fourths of those present at a general committee meeting summoned for that purpose.

BY ORDER OF THE MANAGEMENT.

These rules were confirmed and passed at the inaugural meeting on May 6th, 1901.



